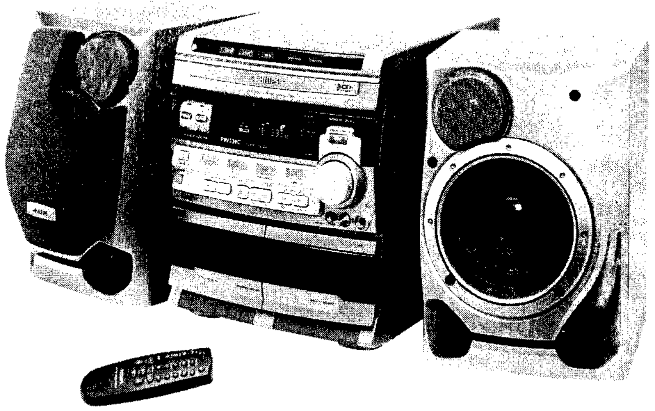
Mini System

FW339C/21/21M/22/30
FW338C/37

Service
Service
Service



Service Manual

TABLE OF CONTENTS

Page

Location of pc boards & Version variations 1-2
Technical Specifications 1-3
Measurement setup 1-4
Service Aids, Safety Instruction, etc. 1-5
Instruction for use: European version exerpt 2-1
Additional featuress - others ... 2-10
Disassembly Instructions & Service positions 3-1
Service Test Programs 3-3
Set Block diagram 4
Set Wiring diagram 5
Front Board 6
Tuner Board: ECO5 Sys 7B
Tuner 95 .... 7D
MTF Module 9
3CDC Module 10
Combi Board 11
Set Mechanical Exploded view & parts list 12

CLASS 1
LASER PRODUCT

© Copyright 1998 Philips Consumer Electronics B.V. Eindhoven, The Netherlands
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.

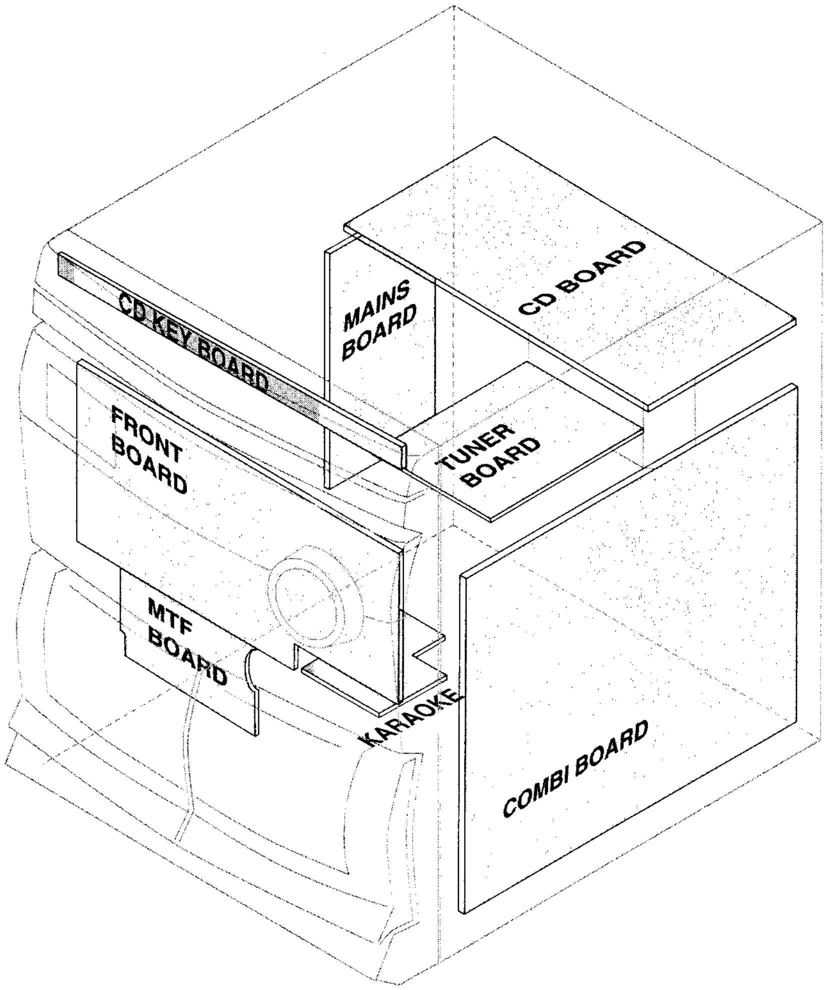
Published by KC 9813 Service Audio   Printed in The Netherlands   Subject to modification

GB 4822 725 25799

PCS 100 103

PHILIPS

LOCATION OF PC BOARDS


CD KEY BOARD
MAINS BOARD
CD BOARD
FRONT BOARD
TUNER BOARD
MTF BOARD
KARAOKE
COMBI BOARD

VERSION VARIATIONS:

Type /Versions:	FW339C						FW338C	
Features & Board in used:	/21	/21M	/22	/30			/37	
Aux Input	x	x	x	x			x	
Line Output								
Subwoofer Output							x	
Surround Output								
Digital Output								
Dolby B								
RDS								
Incredible Surround	x	x	x	x				
Karaoke Feature	x	x						
Tuner board - ECO5 Sys	x	x		x			x	
Tuner board - Tuner 95			x					
Remote Control RC07102/01	x	x	x	x				
Remote Control RC0799/04							x	

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30
Mains frequency : 50/60Hz
Power consumption : < 15 W at power mode "OFF"
< 44 W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 320mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/37
Grid : 9kHz
10kHz for /21/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power (6ohm, 1 kHz, 10% THD) : 2 x 25W ± 1dB
Frequency response within -3dB : 50Hz-15kHz
Dynamic Bass Boost : DBB ON, DBB Off 1)
Digital Sound Control : Jazz, Techno, Optimal, Rock
Incredible Surround : IS ON, IS Off 1)
Headphone output at 32 ohm : 16.5mW
Input sensitivity
Aux/Line-in : 700mV ± 2dB at 600ohm
Mic : 2.5mV ± 2dB at 600ohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
1.7 x 4.76 cm/sec
Wow and flutter : < 0.4% DIN
Fast-wind/rewind time C60 : 110 sec
Bias system : 75kHz ± 5kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio : > 43dB

COMPACT DISC:

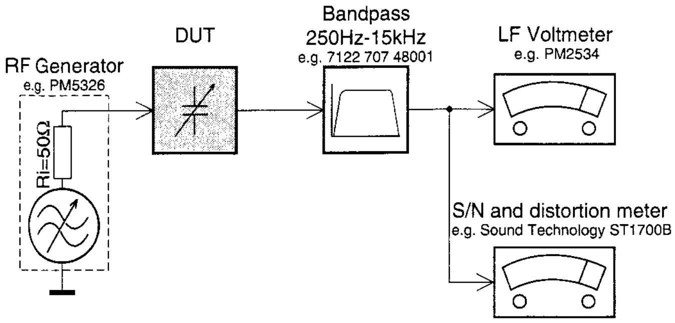
Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 1dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 45dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

1) Frequency response in each setting is software controlled.

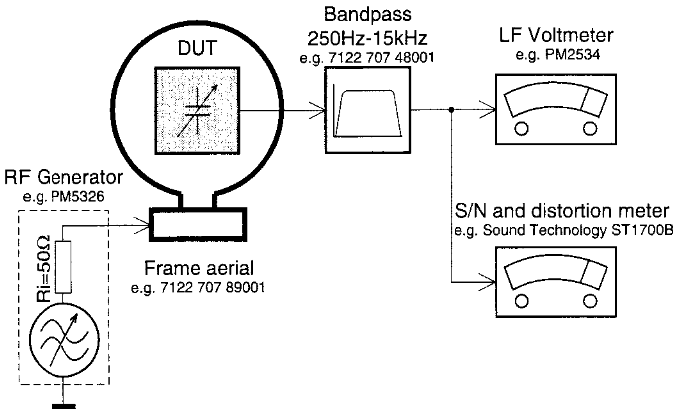
MEASUREMENT SETUP

Tuner FM


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

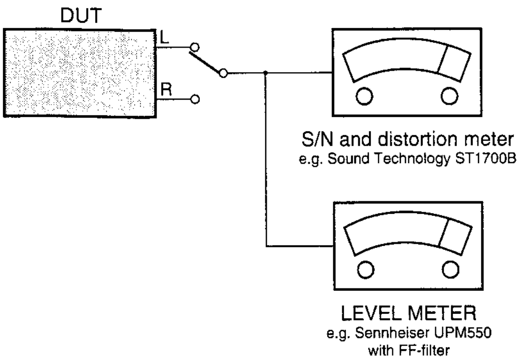
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

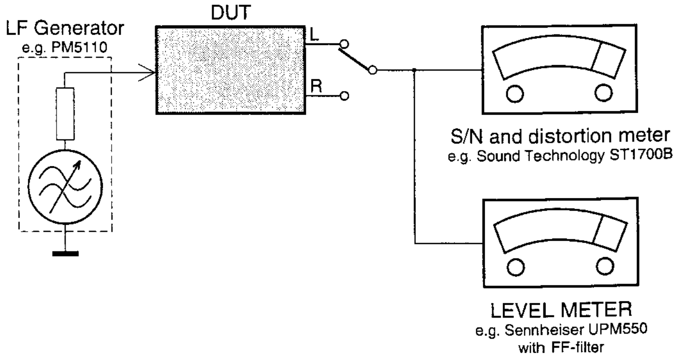
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

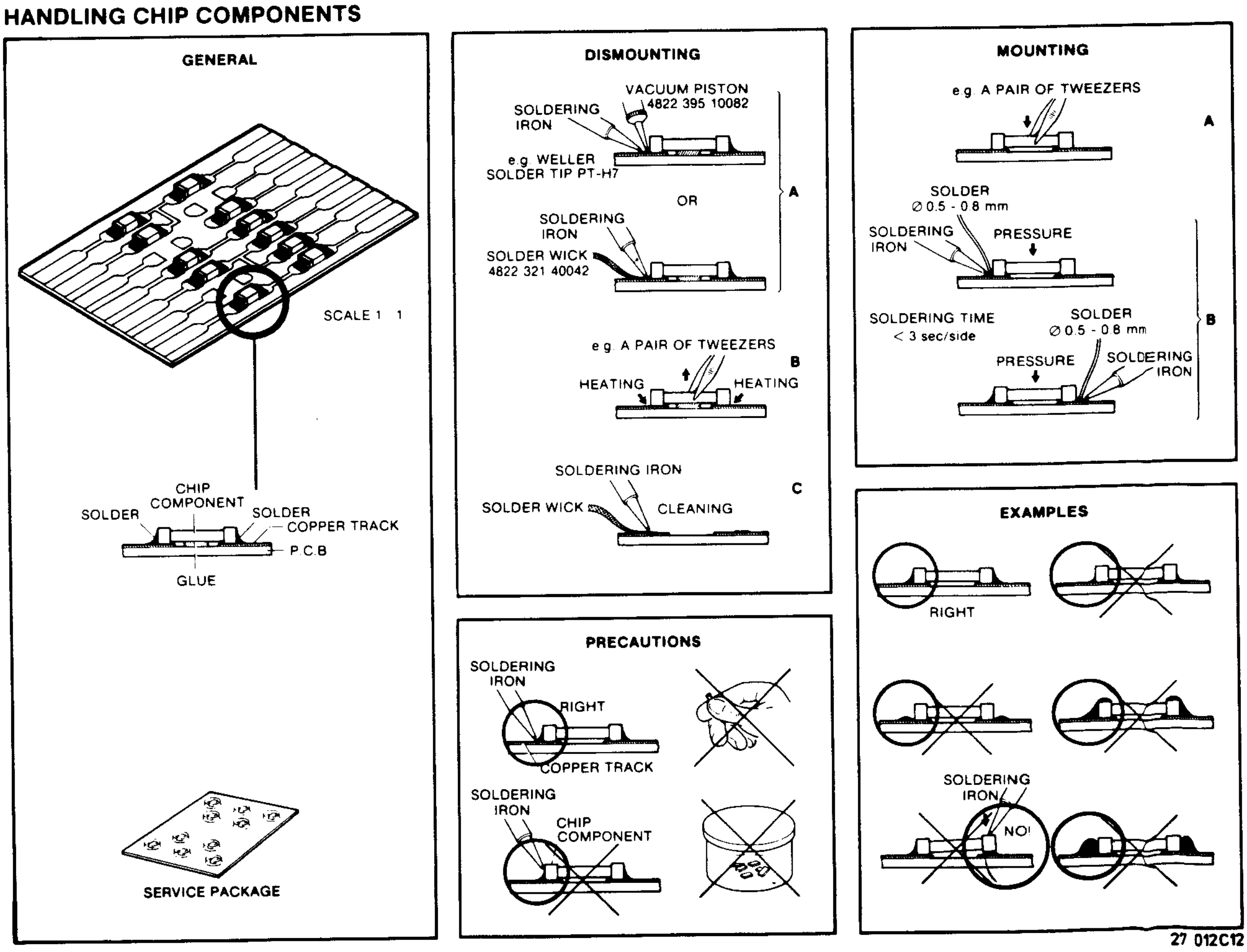
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK
4822 321 40042
A
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
SOLDER WICK
CLEANING
C
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
< 3 sec/side
SOLDER
Ø 0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

ESD

GB WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

CONTENTS

General Information 5

Safety Information 5

Preparation .... 6 - 7

Controls .... 8 - 9

Operating The System .... 10 - 11

CD .... 12 - 14

Tuner .... 14 - 16

Tape .... 16 - 17

Aux 17

Recording .... 18 - 19

Clock 19

Timer 20

Maintenance 21

Specifications 21

Troubleshooting 22

GENERAL INFORMATION

General Information

- ***The type plate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This product complies with the radio interference requirements of the European Community.***

Environmental Information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials: cardboard (box), polystyrene foam (buffer) and polythene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Accessories *(Supplied)*

- Remote control
- Batteries (2 x AAA size) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord

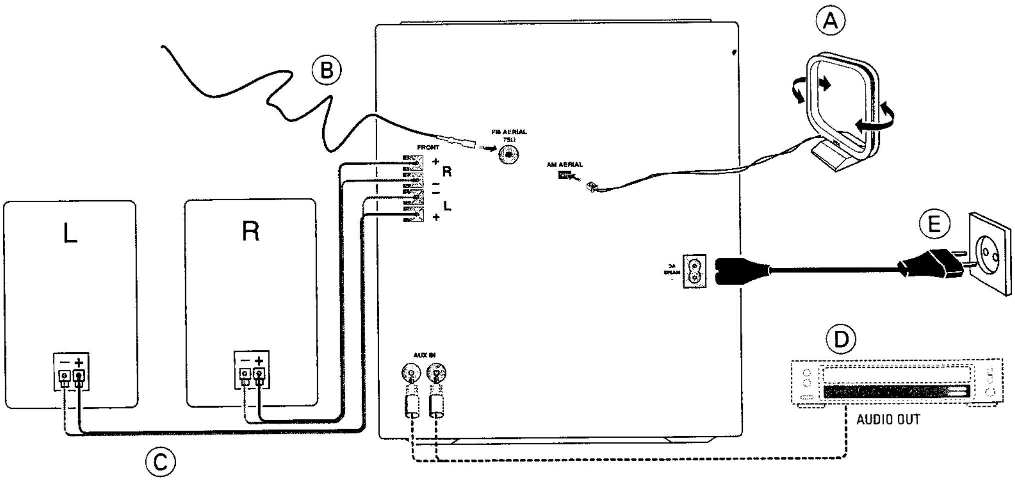
SAFETY INFORMATION

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATION

Rear Connections



Ⓐ AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

Ⓑ FM Wire Antenna Connection

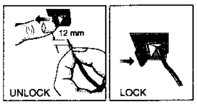
Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speaker Connections

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.


12 mm
UNLOCK
LOCK

Ⓓ Connecting other equipment to your system

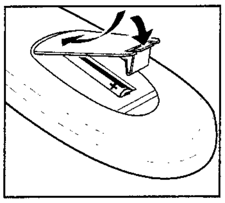
You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc or DVD player to the AUX IN terminals at the rear of the system.

Ⓔ AC Power Supply

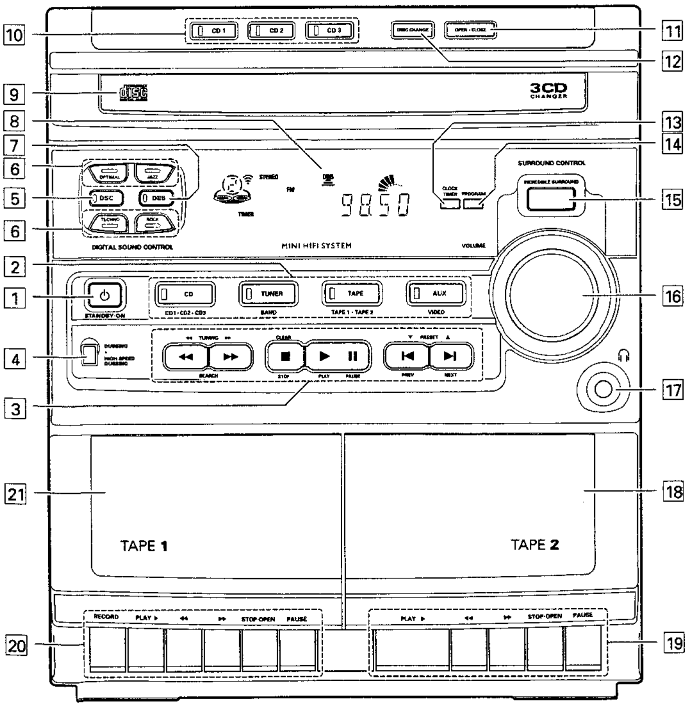
After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

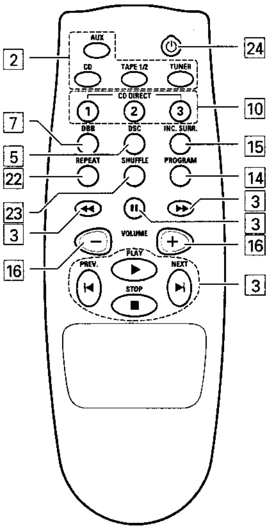
Inserting batteries into the Remote Control

- Insert the batteries (Type R03 or AAA) into the remote control as shown in the battery compartment.

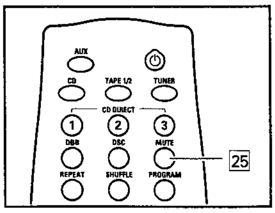


- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R03 or AAA batteries.


10
9
8
7
6
5
6
2
1
4
3
21
20
11
12
13
14
15
16
17
18
19
CD 1
CD 2
CD 3
DISC CHANGE
OPEN • CLOSE
3CD CHANGER
DISC
DBB
DIGITAL SOUND CONTROL
STEREO
FM
TIMER
MINI HIFI SYSTEM
CLOCK TIMER
PROGRAM
SURROUND CONTROL
INCREDIBLE SURROUND
VOLUME
STANDBY-ON
CD
TUNER
TAPE
AUX
CD1 • CD2 • CD3
BAND
TAPE 1 • TAPE 2
VIDEO
DUBBING
HIGH SPEED DUBBING
TUNING
SEARCH
CLEAR
STOP
PLAY
PAUSE
PRESET
PREV
NEXT
TAPE 1
TAPE 2
RECORD
PLAY ▶
◀◀
▶▶
STOP•OPEN
PAUSE


2
7
5
22
23
3
16
24
10
15
14
3
3
16
3
AUX
CD
TAPE 1/2
TUNER
CD DIRECT
1
2
3
DBB
DSC
INC. SURR.
REPEAT
SHUFFLE
PROGRAM
VOLUME
–
+
PREV.
PLAY
NEXT
STOP

FW 339C


AUX
CD
TAPE 1/2
TUNER
CD DIRECT
1
2
3
DBB
DSC
MUTE
REPEAT
SHUFFLE
PROGRAM
25

FW 316C

CONTROLS

Controls on the system and remote control

1 STANDBY-ON
– to switch the system on or to standby mode.
– to store radio stations automatically by pressing and holding for 2 seconds.

2 SOURCE : to select the following.
CD / (CD 1•2•3)
– to select CD mode. When CD in stop mode; to select the respective disc tray.
TUNER / (BAND)
– to select Tuner mode. When in tuner mode; to select the waveband: FM, MW or LW.
TAPE / (TAPE 1•2)
– to select Tape mode.
AUX / (VIDEO)
– to select sound from an external source (e.g. TV, Laser Disc, DVD or VCR player).

3 MODE SELECTION
SEARCH ◀◀ ▶▶ (TUNING ◀◀ ▶▶)
for CD .... to search backward/forward.
for TUNER ..... to tune to a lower or higher radio frequency.
STOP ■ (CLEAR)
for CD .... to stop CD playback or clear a program.
for TUNER ..... to stop programming.
PLAY PAUSE ▶ II
for CD .... to start or interrupt playback.
PREV I◀ / NEXT ▶I (PRESET ▲ ▼)
for CD .... to skip to the beginning of the current or previous/next track.
for TUNER ..... to select a preset station in memory.

4 DUBBING
– to dub a tape in normal or high speed.

5 DIGITAL SOUND CONTROL (DSC)
– to select the desired sound effect : OPTIMAL, JAZZ, ROCK or TECHNO.

6 DIGITAL SOUND CONTROL DISPLAY PANEL
– to view the selected DSC display.

7 DYNAMIC BASS BOOST (DBB)
– to switch on bass boost to enhance bass response or to switch off bass boost.

8 DISPLAY
– to view the current setting of the system.

9 CD CAROUSEL TRAY

10 3 CD DIRECT PLAY
– to select a CD tray for playback.

11 OPEN•CLOSE
– to open or close the CD carousel tray.

12 DISC CHANGE
– to change CD(s).

13 CLOCK•TIMER
– to view clock, set clock or timer.

14 PROGRAM
– to program CD tracks in CD mode or preset radio stations in tuner mode.

15 INCREDIBLE SURROUND *(available in model FW339C only)*
– to switch on or off the surround sound effect.

16 VOLUME
– to adjust the volume level.

17 HEADPHONES 🎧
– to connect headphones.

18 TAPE DECK 2

19 TAPE DECK 2 OPERATION
PLAY ▶ .... to start playback.
◀◀ .... to rewind the tape.
▶▶ .... to fast forward the tape.
STOP•OPEN .... to stop playback or to open the tape door.
PAUSE .... to interrupt playback.

20 TAPE DECK 1 OPERATION
RECORD .... to start recording.
PLAY ▶ .... to start playback.
◀◀ .... to rewind the tape.
▶▶ .... to fast forward the tape.
STOP•OPEN .... to stop playback/recording or to open the tape door.
PAUSE .... to interrupt playback or recording.

21 TAPE DECK 1

22 REPEAT
– to repeat a CD track.

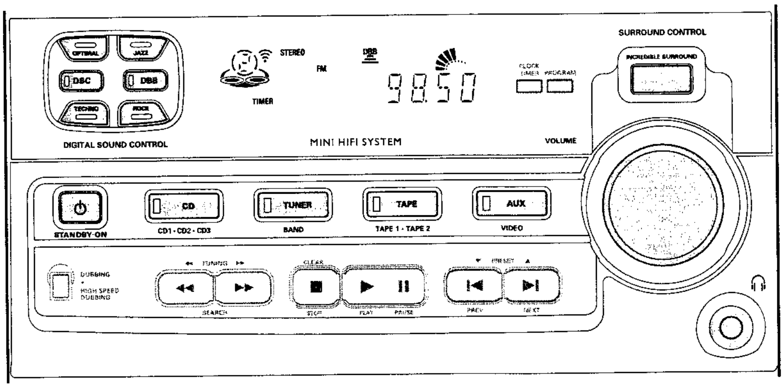
23 SHUFFLE
– to play all the available discs and their tracks in random order.

24 ⏻
– to switch the system to standby mode.

25 MUTE *(available in model FW316C only)*
– to switch off the sound temporarily.

Notes for remote control:
– *First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).*
– *Then select the desired function (PLAY, NEXT, etc.).*

OPERATING THE SYSTEM



Important:
Before you begin operating the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.***

Notes:
– *During demonstration mode, if you press any source (or standby-on) button, the system will switch to the respective (or standby) mode.*
– *When the system is switched to standby mode, 5 seconds later, the demonstration mode will resume.*

To cancel demonstration mode
- Press and hold **STOP ■** *(on the system only)* for ***3 seconds*** to stop the demonstration.
→ The demonstration mode will be switched off permanently.
→ The system will switch to standby mode.

Easy Set

EASY SET allows you to store all available radio stations in a particular band (FM, MW or LW) automatically.

- Press and hold **STANDBY•ON** *(on the system only)* for 2 seconds; when the system is in standby or demonstration mode.
→ "EASY SET" will be displayed and followed by "TUNER".
→ EASY SET will start with the last active band.
→ All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

Notes :
– *When EASY SET is used, all previously stored stations will be erased.*
– *The last preset station will appear on the display when EASY SET is completed.*

Switching the system ON

- Press **STANDBY•ON** *(on the system only)*, **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the 3 CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again.
→ The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
→ The display indicates the selected source.

Note:
– *For an external source, make sure that you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals.*

Sound Control

Volume Adjustment

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

Digital Sound Control (DSC)

The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, JAZZ, ROCK or TECHNO.
  → The Digital Sound Control display panel will light up respectively.
  → "OPTIMAL, JAZZ, ROCK or TECHNO" will be displayed.

Automatic DSC-DBB selection

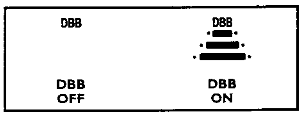
The best setting for the DBB is automatically generated for the respective DSC selection. You can manually select the DBB setting that best suits your listening environment.

DSC Selection	DBB On/Off
Optimal →	On
Techno →	On
Rock →	Off
Jazz →	Off

Dynamic Bass Boost (DBB)

The DBB mode enhances the bass response.

- Press **DBB** to switch on bass response.
  → The DBB button lights up.
  → "DBB ON" will be displayed.


DBB
DBB
DBB OFF
DBB ON

To switch off DBB

- Press **DBB** again.
  → The DBB button light is switched off.
  → "DBB OFF" will be displayed.

Note:
– *Some CDs or tapes might be recorded in high modulation. It may cause a distortion at high volume. If this occurs, switch off Incredible Surround (if available), DBB level or reduce the volume.*

Incredible Surround *(available in model FW339C only)*

Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

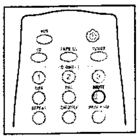
- Press **INCREDIBLE SURROUND** to switch on.
  → The INCREDIBLE SURROUND button lights up.
  → "IS" will be displayed.

To switch off Incredible Surround

- Press **INCREDIBLE SURROUND** again.
  → The INCREDIBLE SURROUND button light is switched off.
  → "IS OFF" will be displayed.

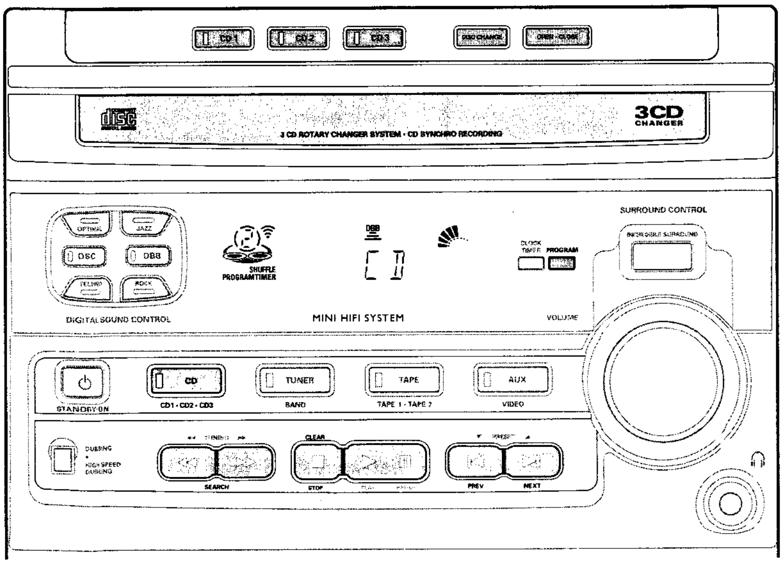
Mute *(available in model FW316C remote control only)*

This feature allows you to temporarily switch off the sound of the system without switching off the system when you require a moment of silence.



- Press **MUTE** on the remote control to switch off the sound.
  → "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.

CD


CD 1
CD 2
CD 3
DISC CHANGE
OPEN•CLOSE
disc
3CD CHANGER
3 CD ROTARY CHANGER SYSTEM · CD SYNCHRO RECORDING
OPTIMAL
JAZZ
DSC
DBB
TECHNO
ROCK
DIGITAL SOUND CONTROL
DBB
SHUFFLE
PROGRAM/TIMER
CD
CLOCK TIMER
PROGRAM
SURROUND CONTROL
INCREDIBLE SURROUND
MINI HIFI SYSTEM
VOLUME
STANDBY-ON
CD
CD1 · CD2 · CD3
TUNER
BAND
TAPE
TAPE 1 · TAPE 2
AUX
VIDEO
DUBBING
HIGH SPEED DUBBING
SEARCH
CLEAR
STOP
PREV
NEXT

Warning!

1) This system is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.

2) Do not load more than one disc into each tray.

3) When the CD changer is loaded with CD(s), do not turn over or shake the system. This may jam the changer.

You can load up to three discs in the CD changer for continuous playback without interruption.

Loading the CD Changer

1. Press **CD** to select CD mode.
2. Press **OPEN•CLOSE**.
   → The CD compartment slides out.
3. Load a CD with the printed side up in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press the **DISC CHANGE** button.
  → The CD changer carousel will rotate until the empty tray is at the right hand side and is ready for loading.
  → Playback will always start with the disc in the outer right disc tray.
4. Press **OPEN•CLOSE** to close the CD compartment.
   → The total number of tracks and playing time of the last selected disc appear on the display.

3 CD Direct Play

You can play a CD directly by pressing the **3 CD DIRECT PLAY (1 - 3)** buttons. The CD player will stop at the end of playback of the selected disc.

– When the button is lighted, it indicates that there is a disc loaded in the disc tray.

Playing a CD

1 Press **PLAY** ▶ to start playback.
   → The disc tray, track number and elapsed playing time of the current track appear on the display.
- To interrupt playback, press **PAUSE** ❚❚.
   → The playing time flashes.
- To resume playback, press **PLAY** ▶ again.

2 To stop playback, press **STOP** ■.

Note:
– *All the available discs will play once, then stop. When the CD has stopped playing, the system will switch to the standby mode after 15 minutes if no button is pressed.*

Disc Change

You can change the outer 2 discs while the third inner disc is at the stop or playing mode.

1 Press **DISC CHANGE**.
   → The CD compartment slides out.

2 Replaced the discs in the left and right disc trays.
- If you press **DISC CHANGE** again during playback, the CD will stop playing.
   → The CD carousel tray will rotate until the inner tray is at the right hand side and is ready for changing.

3 Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track at the stop mode

1 Press **PREV** ⏮ or **NEXT** ⏭ until the desired track appears on the display.

2 Press **PLAY** ▶ to start playback.
   → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

1 Press **PREV** ⏮ or **NEXT** ⏭ until the desired track appears on the display.
   → The selected track number and elapsed playing time appear on the display.
- If you press **PREV** ⏮ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
   → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible in the stop mode. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

1 Load the desired discs in the disc trays.

2 Press **PROGRAM** to start programming.
   → The PROGRAM flag starts flashing.

3 Press the **CD 1•2•3** button to select the disc.

4 Press **PREV** ⏮ or **NEXT** ⏭ to select the desired track.

5 Press **PROGRAM** to store the track.
- Repeat steps ***3*** to ***5*** to store other discs and tracks.

6 Press **STOP** ■ once to end programming mode.
   → The total number of tracks programmed and total playing time appear on the display.

Notes:
– *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears in the display instead of the total playing time.*
– *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Playing the program

1 Press **PLAY** ▶ to start program playback.
   → "PLAY PROGRAM" appears on the display.
   → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track will be played repeatedly.
   → The REPEAT and PROGRAM flags will be displayed.

2 Press **STOP** ■ to stop program playback.

Note:
– *If you press any of the 3 CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag will also temporarily disappear from the display and then reappear when the playback for the selected disc ends.*

Reviewing the program

Reviewing of the program is only possible in the stop mode.
- Press **PREV** ⏮ or **NEXT** ⏭ repeatedly to review the programmed tracks.
- Press **STOP** ■ to exit review mode.

Erasing the program (in the stop mode)

- Press **CLEAR** on the system.
   → "PROGRAM CLEARED" will be displayed.

Note:
– *The program will be erased when the system is disconnected from the power supply. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "CLEARED".*

Shuffle *(only on remote control)*

It will play all the available discs and their tracks in random order. Shuffle may also be used when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**.
   → "SHUFFLE" will be displayed.
   → The SHUFFLE flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will now be played in random order until you press **STOP** ■.
- If you press **REPEAT** during shuffling, the current track will be played repeatedly.
   → The REPEAT and SHUFFLE flags will be displayed.

2 Press **SHUFFLE** again to resume normal playback.
   → The SHUFFLE flag disappears from the display.

Repeat *(only on remote control)*

It will play the current track repeatedly.

1 Press **REPEAT** during CD playback.
   → "REPEAT TRACK" will be displayed.
   → The REPEAT flag appears on the display.
- The track will now be played repeatedly until you press **STOP** ■.

2 Press **REPEAT** again to resume normal playback.
   → The REPEAT flag disappears from the display.

Easy Set

EASY SET allows you to store all available radio stations in a particular band (FM, MW or LW) automatically.

- Press and hold **STANDBY•ON** *(on the system only)* for 2 seconds; when the system is in standby or demonstration mode.
   → "EASY SET" will be displayed and followed by "TUNER".
   → EASY SET will start with the last active band.
   → All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.

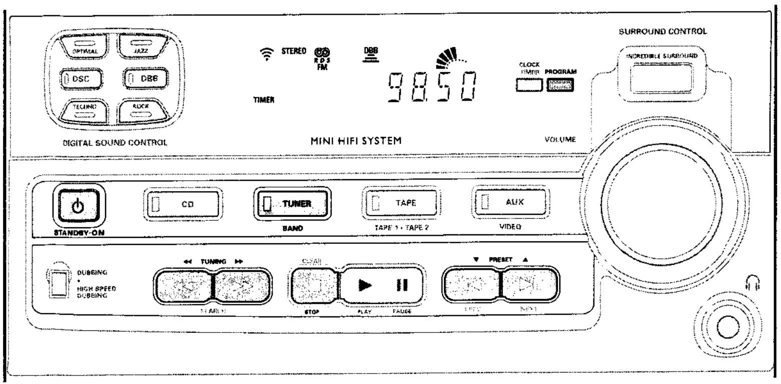
Notes :
– *When EASY SET is used, all previously stored radio stations will be erased.*
– *The last preset radio station will appear on the display when EASY SET* is completed.

Tuning to radio stations

1 Press **TUNER** to select TUNER mode.
   → "TUNER" will be displayed.
   A few seconds later, the current frequency or the radio station name if available will be displayed.

2 Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.

3 Press **TUNING** ◀◀ or ▶▶ for more than one second, then release.
   → The display will show 'SEARCH' until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.


OPTIMAL
JAZZ
DSC
DBB
TECHNO
ROCK
DIGITAL SOUND CONTROL
STEREO
RDS
FM
TIMER
DBB
98.50
CLOCK
TIMER
PROGRAM
SURROUND CONTROL
INCREDIBLE SURROUND
MINI HIFI SYSTEM
VOLUME
STANDBY-ON
CD
TUNER
BAND
TAPE
TAPE 1 · TAPE 2
AUX
VIDEO
DUBBING
HIGH SPEED DUBBING
TUNING
CLEAR
PRESET
SEARCH
STOP
PLAY
PAUSE
PREV
NEXT

- To tune to a weak station, briefly press **TUNING ◀◀** or **▶▶** until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1. Press **TUNER**.
2. Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.
3. Press **PROGRAM** for more than one second.
   → PROGRAM flag starts flashing and 'AUTO' will be displayed.
   → Every available station for the selected waveband will be stored automatically. The frequency and preset number will be displayed briefly.
   → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
   → The system will remain tuned to the last stored preset radio station.

- Repeat the above procedure to store other preset radio stations for the other waveband. Remember to select the next available preset number before proceeding. If not, some of the preset radio stations may be erased.

Notes:

– You can cancel the automatic programming by pressing PROGRAM or STOP ■ on the system only.

– If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 40 will be programmed.

Manual programming

1. Press **TUNER**.
2. Press **TUNER** (BAND) to select the desired waveband : FM, MW or LW.
3. Press **PROGRAM** for less than one second.
   → PROGRAM flag, the frequency and preset number start flashing.
   → The next available preset number will be displayed for selection.
4. Press **TUNING ◀◀** or **▶▶** to tune to the desired frequency.
   - If you wish to store the radio station to another preset number, press **PRESET ▼** or **▲** to select the desired preset number.
5. Press **PROGRAM** again.
   → PROGRAM flag will stop flashing, and the radio station will be stored.

- Repeat the above procedure to store other preset radio stations.

Notes:

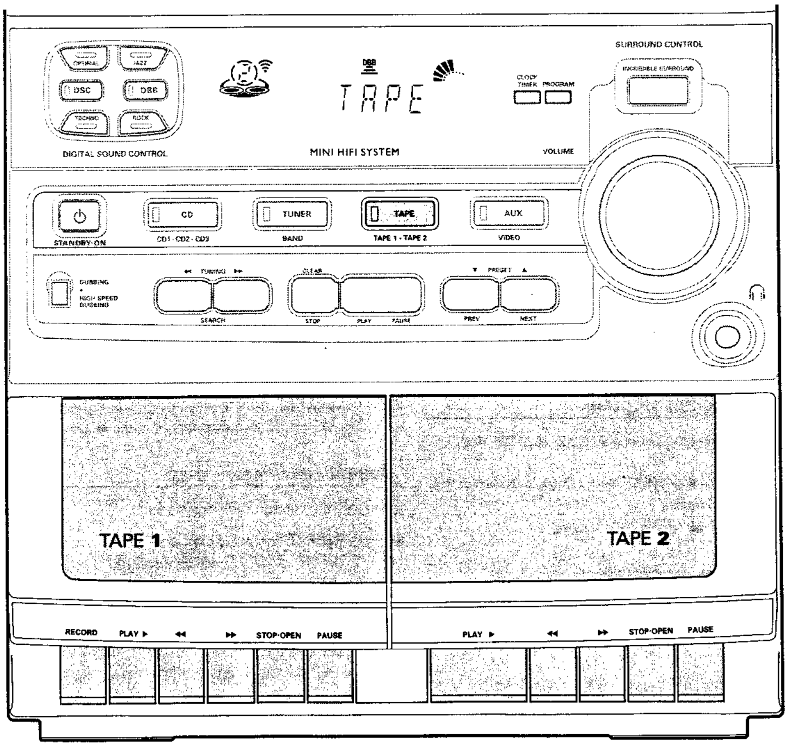
– When 40 radio stations are stored and you attempt to store another radio station, the display will show " PROGRAM FULL ". If you want to change an existing preset number; repeat steps 4 and 5.

– You can cancel manual programming by pressing STOP ■ on the system only.

– During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.

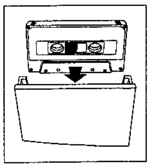
Tuning to Preset Radio Stations

- Press **PRESET ▼** or **▲** to select the desired preset number.
  → The preset number, frequency and waveband appear on the display


OPTIMAL
JAZZ
DSC
DBB
TECHNO
ROCK
DIGITAL SOUND CONTROL
DBB
TAPE
CLOCK
TIMER
PROGRAM
SURROUND CONTROL
INCREDIBLE SURROUND
MINI HIFI SYSTEM
VOLUME
STANDBY-ON
CD
CD1 · CD2 · CD3
TUNER
BAND
TAPE
TAPE 1 · TAPE 2
AUX
VIDEO
DUBBING
HIGH SPEED DUBBING
TUNING
CLEAR
PRESET
SEARCH
STOP
PLAY
PAUSE
PREV
NEXT
TAPE 1
TAPE 2
RECORD
PLAY ▶
◀◀
▶▶
STOP·OPEN
PAUSE
PLAY ▶
◀◀
▶▶
STOP·OPEN
PAUSE

TAPE

Loading a tape



- Press **STOP•OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.

Tape Playback

1 Press **TAPE** to select TAPE mode.
  → "TAPE" will be displayed.
2 Load the tape into the selected tape deck.
3 Press **PLAY** ▶ to start playback.
- To interrupt playback, press **PAUSE**.
- To resume playback, press **PAUSE** again.
4 Press **STOP•OPEN** to end playback.

Rewind/Fast Forward

At the stop mode

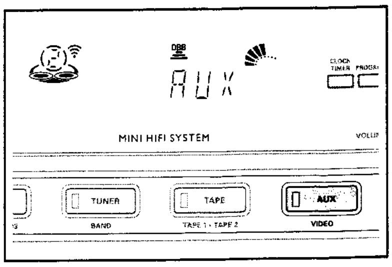
1 You can rewind or fast forward a tape by pressing ◀◀ or ▶▶ respectively.
  → The tape will stop automatically at the end of rewinding or fast forwarding.
2 Press **STOP•OPEN** to stop rewinding or fast forwarding.

Continuous Playback From Tape Deck 2 to Tape Deck 1

1 Press **TAPE** to select TAPE mode.
2 Load the tapes in **tape deck 1** and **2**.
3 Press **PLAY** ▶ on **tape deck 2**.
4 Press **PAUSE** on **tape deck 1**.
5 Press **PLAY** ▶ on **tape deck 1**.
  → Playback will begin with tape deck 2 and will continue with tape deck 1 when playback on tape deck 2 ends.
6 Press **STOP•OPEN** if you want to stop playback before the end of the tape in **tape deck 1** or **tape deck 2**.

Notes:
- During rewinding or fast forwarding of a tape, it is also possible to select another source mode (e.g. CD, TUNER or AUX mode).
- *Check and tighten slack tape before use with a pencil. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV or loudspeaker boxes).*

AUX


DBB
AUX
CLOCK
TIMER PROGRAM
MINI HIFI SYSTEM
VOLUME
TUNER
TAPE
AUX
BAND
TAPE 1 • TAPE 2
VIDEO

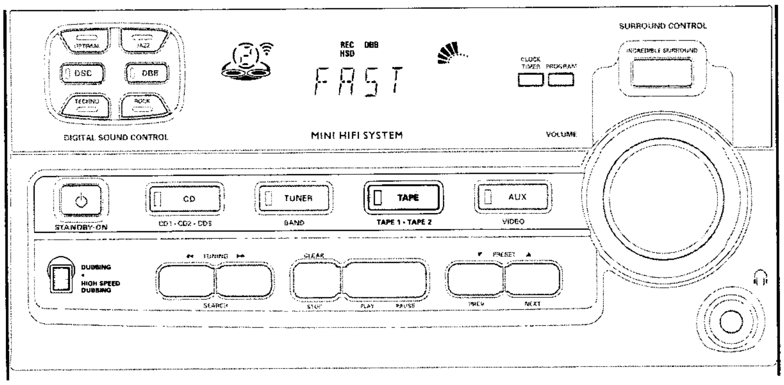
Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX** to select the external mode.
  → "AUX" will be displayed.

Note:
- *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

RECORDING


OPTIMAL
JAZZ
DSC
DBB
TECHNO
ROCK
DIGITAL SOUND CONTROL
REC
DBB
HSD
FAST
CLOCK
TIMER PROGRAM
MINI HIFI SYSTEM
VOLUME
SURROUND CONTROL
INCREDIBLE SURROUND
STANDBY-ON
CD
CD1 • CD2 • CD3
TUNER
BAND
TAPE
TAPE 1 • TAPE 2
AUX
VIDEO
DUBBING
HIGH SPEED DUBBING
TUNING
SEARCH
CLEAR
STOP
PLAY
PAUSE
PRESET
PREV
NEXT

Notes:
- *For recording, use only tape of IEC type I (normal tape).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of VOLUME, DBB or Incredible Surround (if available).*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*

One Touch Recording

- For One Touch Recording, as soon as you press RECORD, the current source will be recorded on tape deck 1.

1 Load a blank tape in tape deck 1.
2 Press **RECORD** on tape deck 1 to start recording.
  → The REC flag starts flashing.
3 Press **PAUSE** to interrupt recording.
4 Press **STOP•OPEN** on tape deck 1 to stop recording.

Dubbing tapes *(from tape deck 2 to tape deck 1)*

1 Load the prerecorded tape into tape deck 2 and a blank tape into tape deck 1.
  → Make sure that both tapes have their full spool to the left.
2 Press **DUBBING** to switch between normal and high speed dubbing.
  → "NORMAL" (normal speed) or "FAST" (high speed) will be displayed.
  → HSD flag appears on the display for high speed dubbing.
3 Press **PAUSE** on tape deck 1.
4 Press **RECORD** on tape deck 1.
5 Press **PLAY** on tape deck 2.
  → Recording will start automatically.
  → The REC flag starts flashing.
6 Press **STOP•OPEN** on tape deck 1 and tape deck 2 to stop dubbing.

Notes:
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 2 to tape deck 1.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*

RECORDING

CD Synchro Start Recording

During CD synchro start recording,

- It is not advisable to fast forward/rewind your tape in tape deck 2.
- It is not possible to listen to another source.

1 Load a blank tape into tape deck 1 and a disc into the disc tray.
2 Press **CD**.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, the tracks are recorded according to the selected disc.

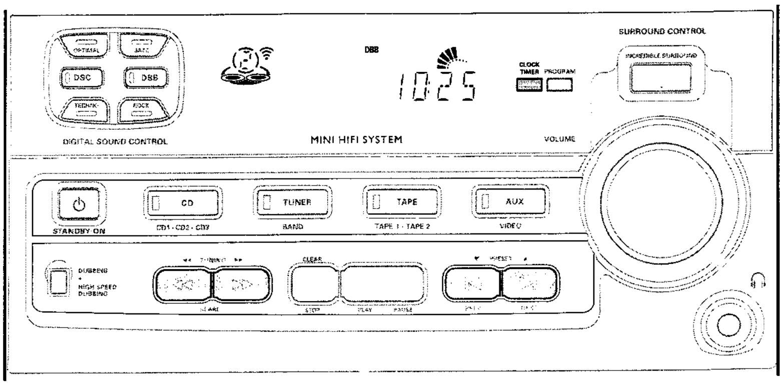
3 Press **RECORD** on tape deck 1 to start recording.
4 Press **STOP•OPEN** on tape deck 1 to stop recording and **STOP ■** to stop CD playback.

Recording from other sources *(only on tape deck 1)*

1 Load a blank tape into tape deck 1.
2 Press **CD**, **TUNER**, **TAPE** or **AUX**.
- Start playback of the selected source.

3 Press **RECORD** on tape deck 1 to start recording.
   → The REC flag is flashing.
4 Press **PAUSE** to interrupt recording.
5 Press **STOP•OPEN** on tape deck 1 to stop recording.

Note:
- *During recording, it is not possible to listen to another sound source.*



CLOCK

View Clock

You can view the clock (if it is set) at standby or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK•TIMER** briefly.
   → " 10:25 " (the current time) will be displayed.
   → " - - : - - " will be displayed if the clock is not set.

Clock Setting

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK•TIMER** to select clock mode.
   → "00:00" or the current time starts flashing.
   → "◀◀, ▶▶, I◀, ▶I, ■ light up *(for model FW339C only)*.
2 Set the hour with ◀◀ or ▶▶.
3 Set the minute with I◀ or ▶I.
4 Press **CLOCK•TIMER** again to store the setting.
   → The clock starts running.
- To exit without storing the setting, press **STOP ■**.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When a power interruption occurs, the clock setting is erased.*

TIMER

Timer Setting

- The system can switch on to CD or TUNER mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer has to be reset or start again for each subsequent preset time.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

1 Press and hold **CLOCK•TIMER** for more than 2 seconds to select timer mode.
   → "ON 00:00" or the last set timer starts flashing. The TIMER flag flashes.
   → The last selected source is lighted while other available sources are flashing.
   → "◀◀, ▶▶, I◀, ▶I, ■ light up *(for model FW339C only)*.
2 Press **CD** or **TUNER** to select the desired source.
3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press I◀ or ▶I to set the minute for the timer to start.
5 Press **CLOCK•TIMER** to store the start time.
   → The TIMER is now set.
   → The TIMER flag remains on the display.
- To exit without storing the setting, press **STOP ■**.

- At the preset time, the TIMER will be activated.
   → The selected source will be played.
   → The TIMER flag disappears from the display.

Notes:
- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*

To cancel the TIMER

1 Press **CLOCK•TIMER** for more than 2 seconds.
2 Press **PAUSE II** to cancel the timer.
   → "CANCEL" will be displayed.
   → The TIMER flag disappears from the display.

To start the TIMER again *(for the same time)*

1 Press **CLOCK•TIMER** for more than 2 seconds.
2 Press **CLOCK•TIMER** again to store the start time and the selected source.

MAINTENANCE

Maintenance

Cleaning the Cabinet

- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs

- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens

After prolonged usage, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips-Magnavox CD Lens Cleaner or any commercially available. Follow the instructions supplied with the Lens Cleaner.

Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape through once.

Demagnetizing the heads

- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.

- The disc is inserted upside down.
- → *Place CD with printed side up.*
- Moisture condensation at the lens.
- → *Wait until lens has adjusted to normal room temperature.*
- There is no disc in the CD tray.
- → *Insert a CD.*
- The CD is dirty, badly scratched or warped.
- → *Clean or replace the CD.*
- The CD lens is dirty or dusty
- → *See section under Maintenance.*

Radio Reception

Poor radio reception

- The signal strength is too weak.
- → *Adjust the antenna.*
- The TV or VCR is too close to the stereo system.
- → *Separate the stereo system from the TV or VCR.*
- → *Connect an external antenna for better reception.*

Tape Deck Operation

"RECORDING ACTIVE" is displayed.

- A recording is in progress.
- → *Stop the recording or wait until it is finished.*

"TAPE DUBBING ONLY" is displayed.

- Tape dubbing is only possible in tape mode.
- → *Switch source to tape mode.*

Recording or playback cannot be made or there is a decrease in audio level.

- *Dirty tape heads, capstans or pressure rollers.*
- → *See section on tape deck maintenance.*
- Magnetic build-up in the record/playback head.
- → *Use demagnetizing tape.*

General

System does not react when any button is pressed.

- Electrostatic discharge.
- → *Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect and switch on the system again.*

No or poor sound.

- Volume is not turned up.
- → *Adjust VOLUME.*
- The headphones are connected.
- → *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.
- → *Check that the speakers are connected correctly.*
- → *Make sure that the stripped speaker wire is clamped.*

Reversed left and right sound.

- Speakers are connected wrongly.
- → *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Speakers are connected wrongly.
- → *Check the speaker connection for proper phasing, red/black wires to red/black terminals.*

Remote control has no effect on the system.

- The distance to the system is too large.
- → *Reduce the distance.*
- Batteries are inserted incorrectly.
- → *Insert the batteries with their polarities (+/– signs) as indicated..*
- Batteries are exhausted.
- → *Replace the batteries.*
- Wrong source is selected.
- → *Select the source (CD, TUNER, etc.) before pressing the function button, (PLAY, PREV/NEXT, etc.).*

Timer not working.

- Timer is not switched on.
- → *Press CLOCK•TIMER to switch on the timer.*
- Dubbing/recording is in progress.
- → *Stop dubbing/recording.*

System displays features automatically; buttons flash continuously.

- Demo mode is switched on.
- → *Press and hold STOP ■ for 3 seconds to switch off the demonstration.*

ADDITIONAL FEATURES - OTHER VERSION

Tuning to Preset Radio Stations

- Press **PRESET ▼** or **▲** to select the desired preset number.
  → The preset number, frequency and waveband appear on the display

Changing the MW tuning grid

(not available for version /30)

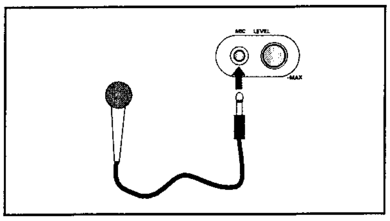
The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step preset in the factory is 9 KHz.

For MW Band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

1. Disconnect the system from the AC power supply *(pull out the AC power cord)*.
2. Press and hold **TUNER** and **TUNING ▸▸** while reconnecting the system to the AC power supply.
   → Display will show "GRID 10" or "GRID 9".

Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset stations will also be erased.*



Microphone Mixing

(not available for model FW316C and version /30)

1. Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2. Connect a microphone to the **MIC** socket.
3. Press **CD**, **TUNER**, **TAPE** or **AUX**.
4. Play the selected source.
5. Adjust the volume level with **VOLUME** control.
6. Adjust the **MIC LEVEL** control to the mixing level that you want.
7. Start singing or talking through the microphone.

Notes:
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of VOLUME, DBB or Incredible Surround (if available).*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*

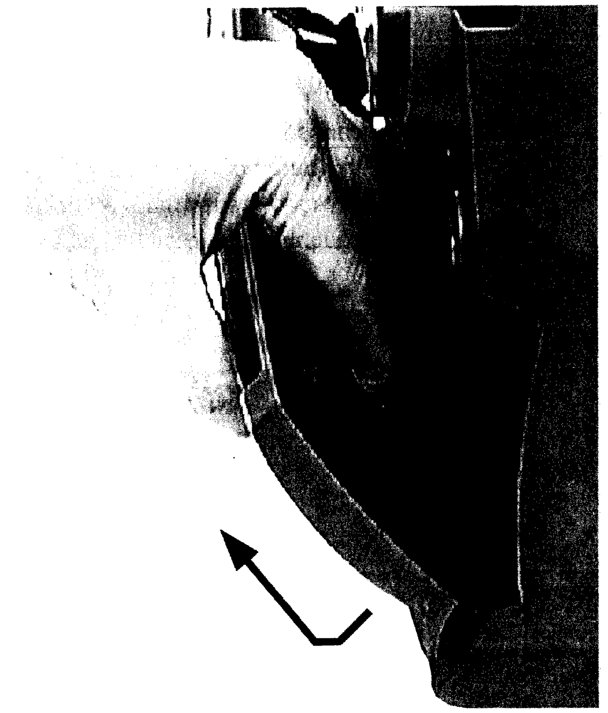
Recording the mixed sound / One Touch Recording

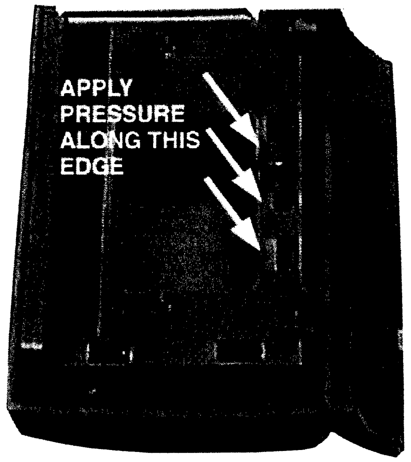
- During microphone mixing *(not available for model FW316C and version /30)*, you can record the mixed sound on a tape in tape deck 1.
- For One Touch Recording, as soon as you press RECORD, the current source (CD, TUNER, TAPE or AUX) will be recorded on tape deck 1

1. Load a blank tape in tape deck 1.
2. Press **RECORD** on tape deck 1 to start recording.
   → The REC flag starts flashing.
3. Press **PAUSE** to interrupt recording.
4. Press **STOP•OPEN** on tape deck 1 to stop recording.

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

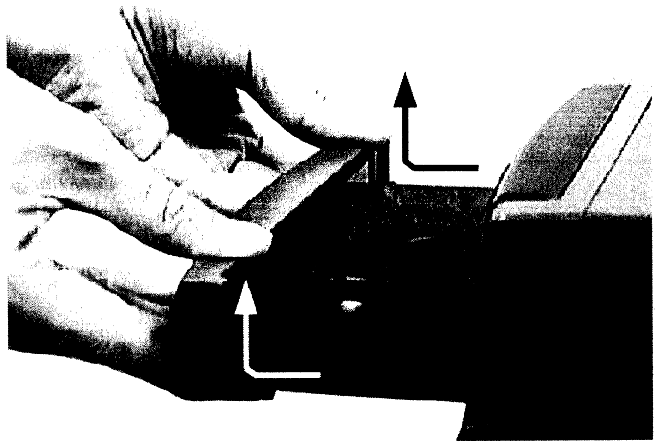


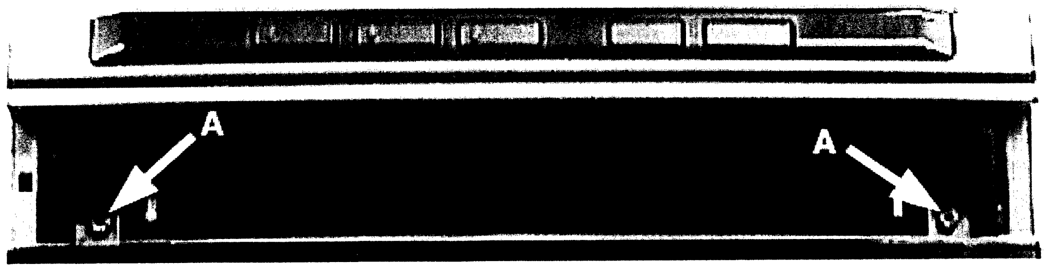


Cassette door

Dismantling of the Front Panel

1) Slide out the tray an remove the CDC front cover as indicated.
2) Loosen the 8 screws to separate the Front Panel from the rear portion.
    - 2 screws A on the front
    - 2 screws each on the left & right side
    - 2 screws at the bottom

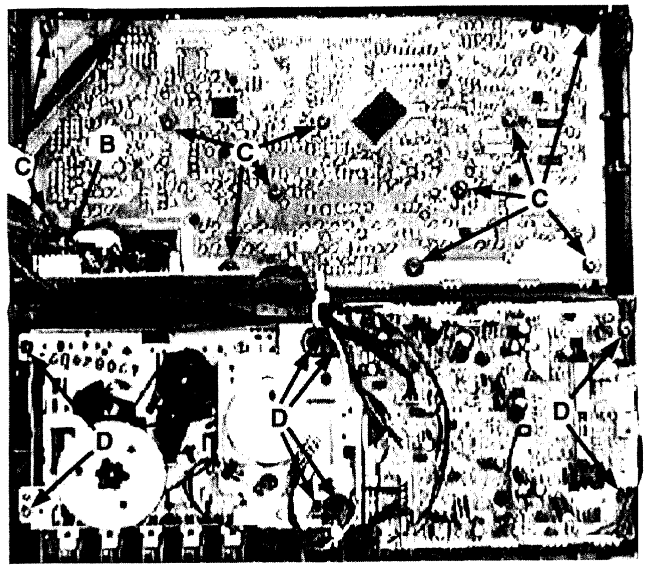




Front CDC Portion

Dismantling of Assemblies on the Front Panel

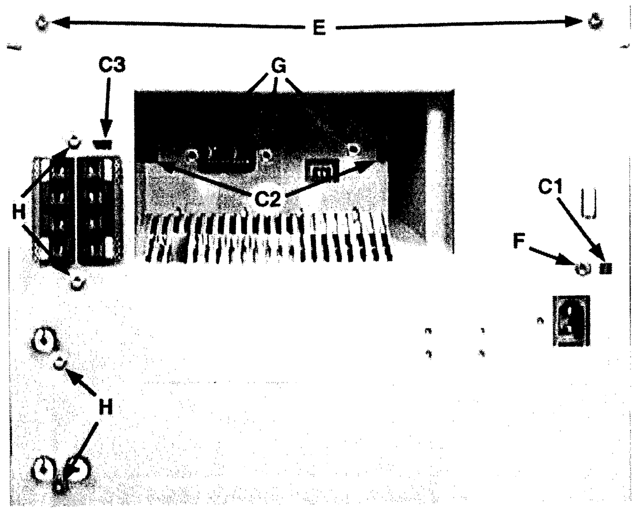
1) Remove 1 screw B to loosen the Karaoke board.
2) Remove 11 screws C as indicated to loosen the Front board.
3) Remove 8 screws D to loosen the MTF Module

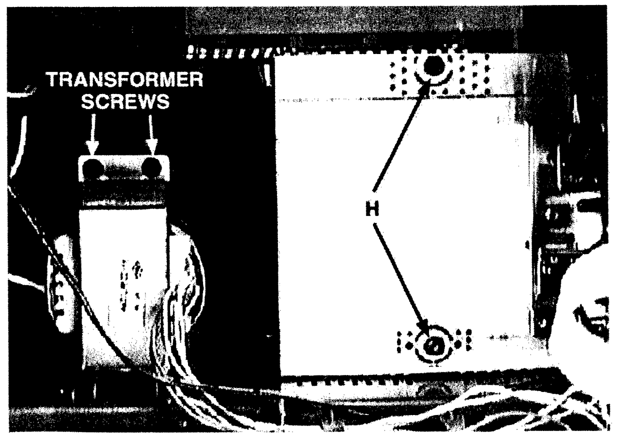


Dismantling of Rear Portion

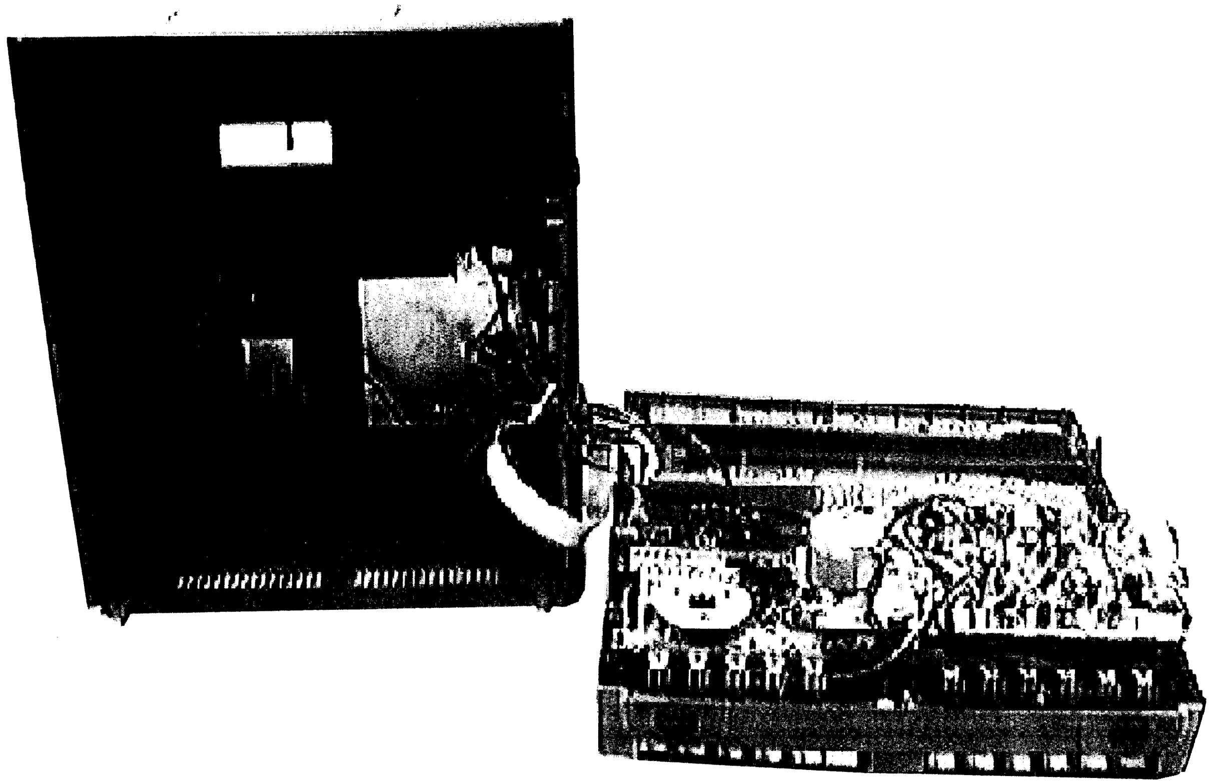
1) Remove 2 screws E to loosen the 3CDC Module.
2) Remove 1 screw F & uncatch C1 to loosen the Mains socket pc board.
3) Remove 3 screws G & uncatch C2 to loosen the Tuner pc board assembly.
4) Remove 6 screws* (4x screw H and 2x screw on the heatsink) & uncatch C3 to loosen the Combi board (Main part).

* Some versions may have less screws

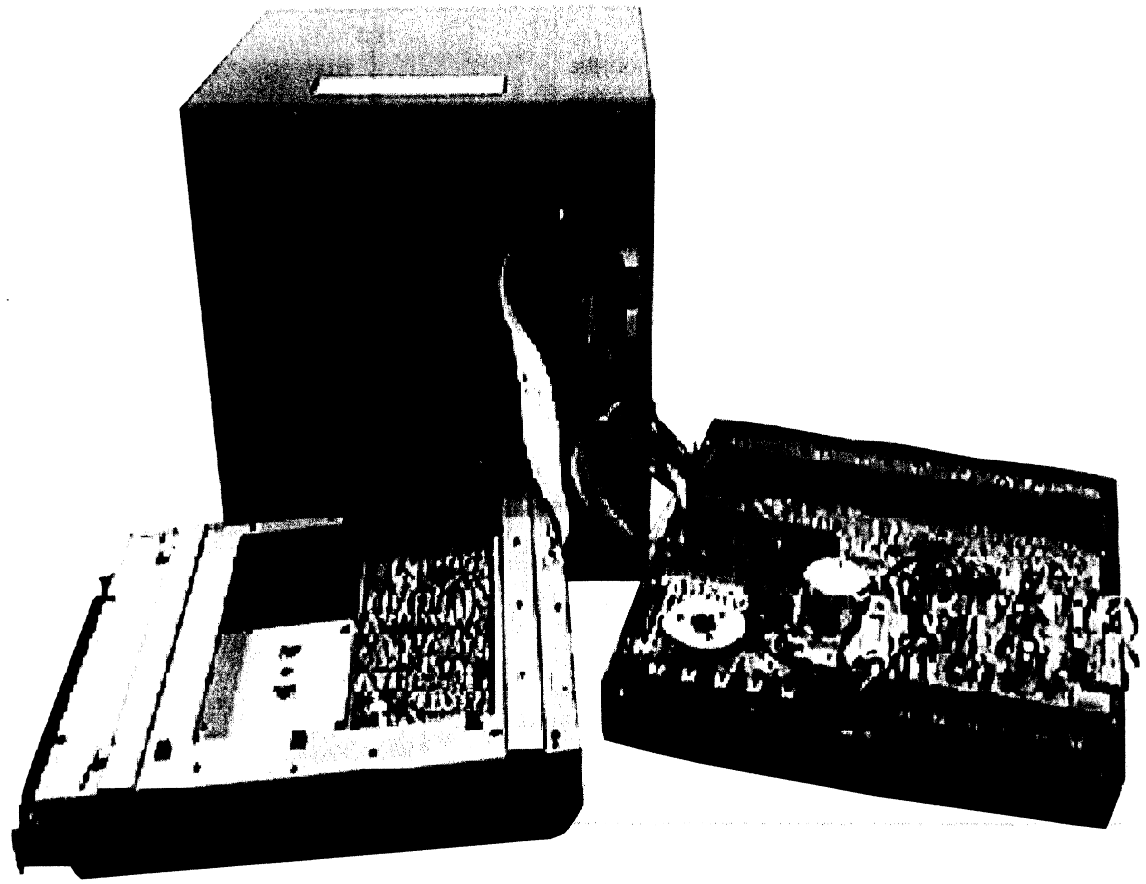




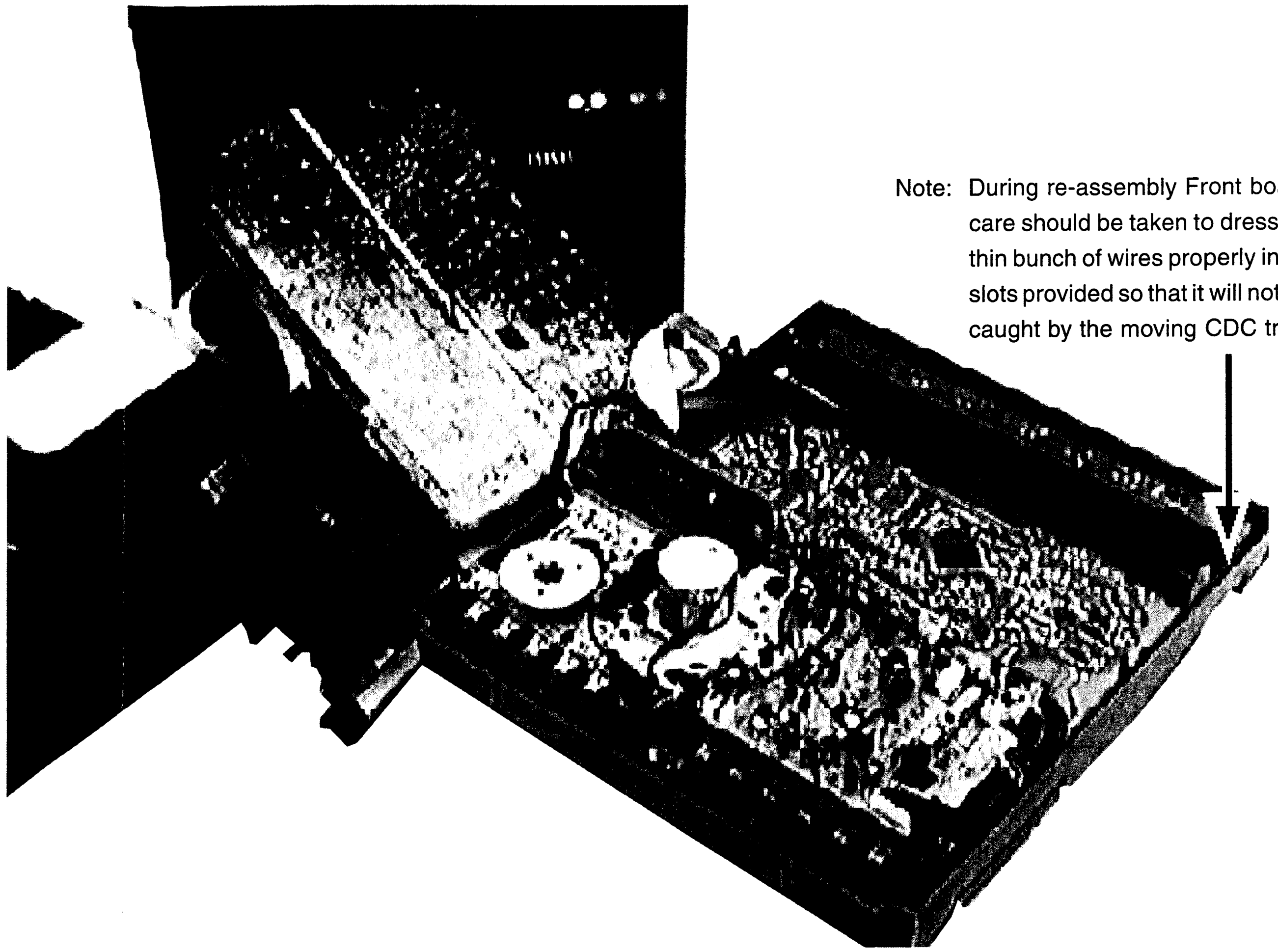
Service pos A



Service pos B

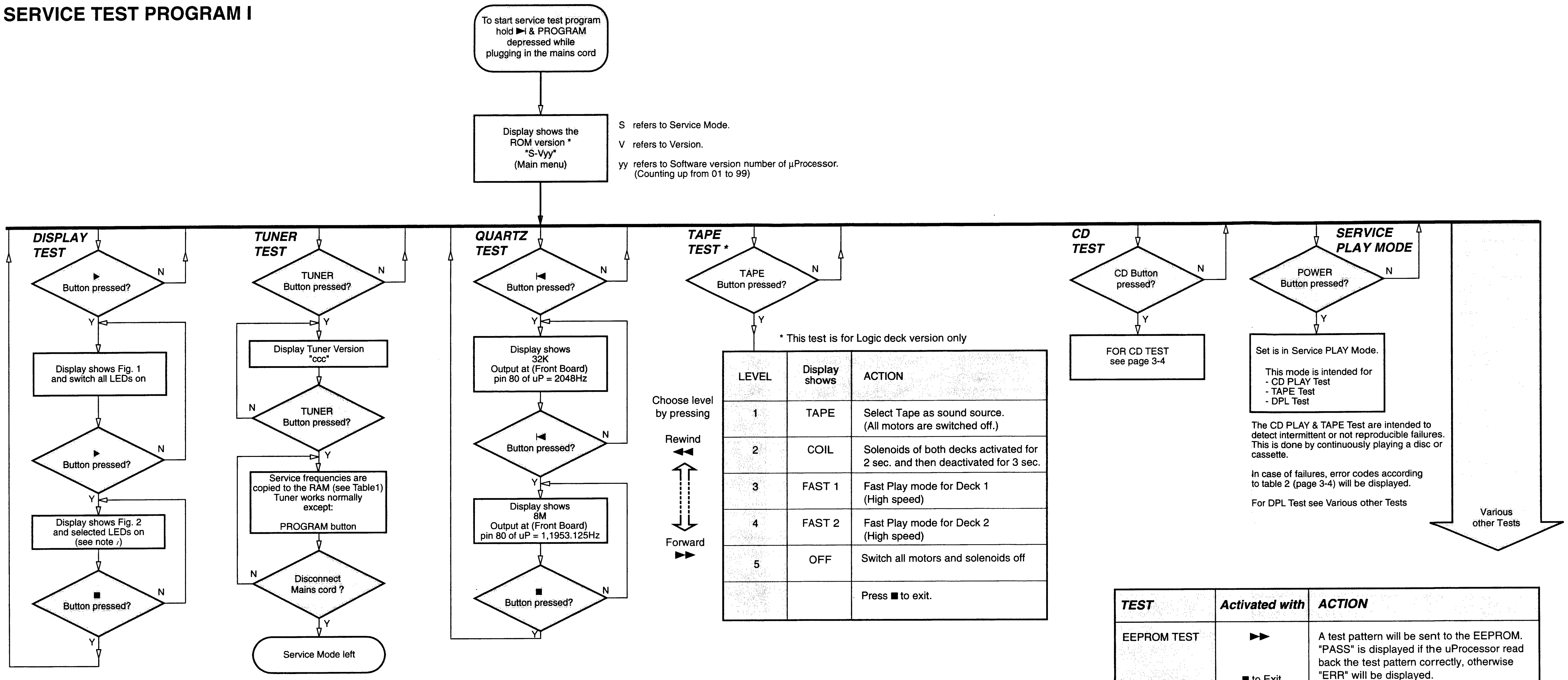


Service pos C



Note: During re-assembly Front board, care should be taken to dress the thin bunch of wires properly in the slots provided so that it will not get caught by the moving CDC tray.

SERVICE TEST PROGRAM I


To start service test program hold ▶I & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version * "S-Vyy" (Main menu)
DISPLAY TEST
▶ Button pressed?
N
Y
Display shows Fig. 1 and switch all LEDs on
▶ Button pressed?
N
Y
Display shows Fig. 2 and selected LEDs on (see note ⁄)
■ Button pressed?
N
Y
TUNER TEST
TUNER Button pressed?
N
Y
Display Tuner Version "ccc"
TUNER Button pressed?
N
Y
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
N
Y
Service Mode left
QUARTZ TEST
I◀ Button pressed?
N
Y
Display shows 32K Output at (Front Board) pin 80 of uP = 2048Hz
I◀ Button pressed?
N
Y
Display shows 8M Output at (Front Board) pin 80 of uP = 1,1953.125Hz
■ Button pressed?
N
Y
TAPE TEST *
TAPE Button pressed?
N
Y
Choose level by pressing
Rewind ◀◀
Forward ▶▶
CD TEST
CD Button pressed?
N
Y
FOR CD TEST see page 3-4
SERVICE PLAY MODE
POWER Button pressed?
N
Y
Set is in Service PLAY Mode.
This mode is intended for
- CD PLAY Test
- TAPE Test
- DPL Test
Various other Tests

S refers to Service Mode.

V refers to Version.

yy refers to Software version number of µProcessor.
(Counting up from 01 to 99)

* This test is for Logic deck version only

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off
		Press ■ to exit.

The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to table 2 (page 3-4) will be displayed.

For DPL Test see Various other Tests

PRESET	Europe "EUR"	East Eur. 3-band "EAS"	East Eur. 2-band "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"	Japan "JAP"
1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz	76MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz	108MHz	CH3 107.75MHz
3	531kHz	74MHz	74MHz	530kHz	531/530kHz	531kHz	90MHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz	CH1 95.75MHz
5	558kHz	531kHz	531kHz	560kHz	558/560kHz	558kHz	CH2 101.75MHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz	531kHz
7	153kHz	558kHz	558kHz	98MHz	87.5MHz	87.5MHz	1602kHz
8	279kHz	1494kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz	558kHz
9	198kHz	153kHz	98MHz	87.5MHz	87.5MHz	87.5MHz	1494kHz
10	98MHz	279kHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz	80MHz
11	87.5MHz	198kHz	65.81MHz	87.5MHz	98MHz	98MHz	76MHz

Table 1

East Europe TUNER IF offset correction

1) Input a reference frequency 87.5MHz from the generator.

2) Proceed to the Tuner Test Mode

3) Hold TUNER button down for > 3 seconds

4) The set will self-calibrate automatically and display "OFS-xx" when calibration is successful, otherwise it will display "00E".

xx : offset value between -3 to +3

Note: This has to be done whenever the Eeprom, Microprocessor or the components in the oscillator circuitry are replaced.

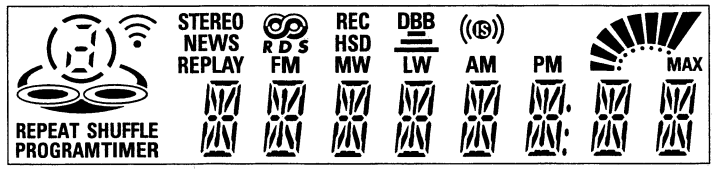
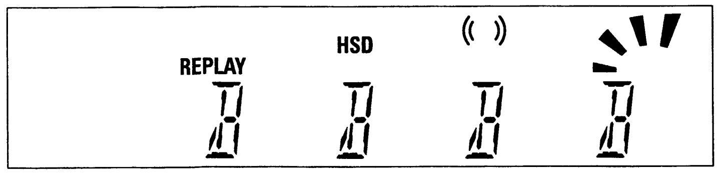

STEREO
NEWS
REPLAY
RDS
FM
REC
HSD
MW
DBB
LW
AM
PM
MAX
REPEAT SHUFFLE
PROGRAMTIMER

Figure 1



note ⁄ : CDC1, CDC3, Tuner, Optimal, Rock, ◀◀, ■ and I◀.

Figure 2

TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	▶I ■ to Exit	Key numbers according table 3 are shown on the display. (see Chapter 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
VOLUME TEST	Volume Knob	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

F = Fatal error & the set stop play function W = Warning

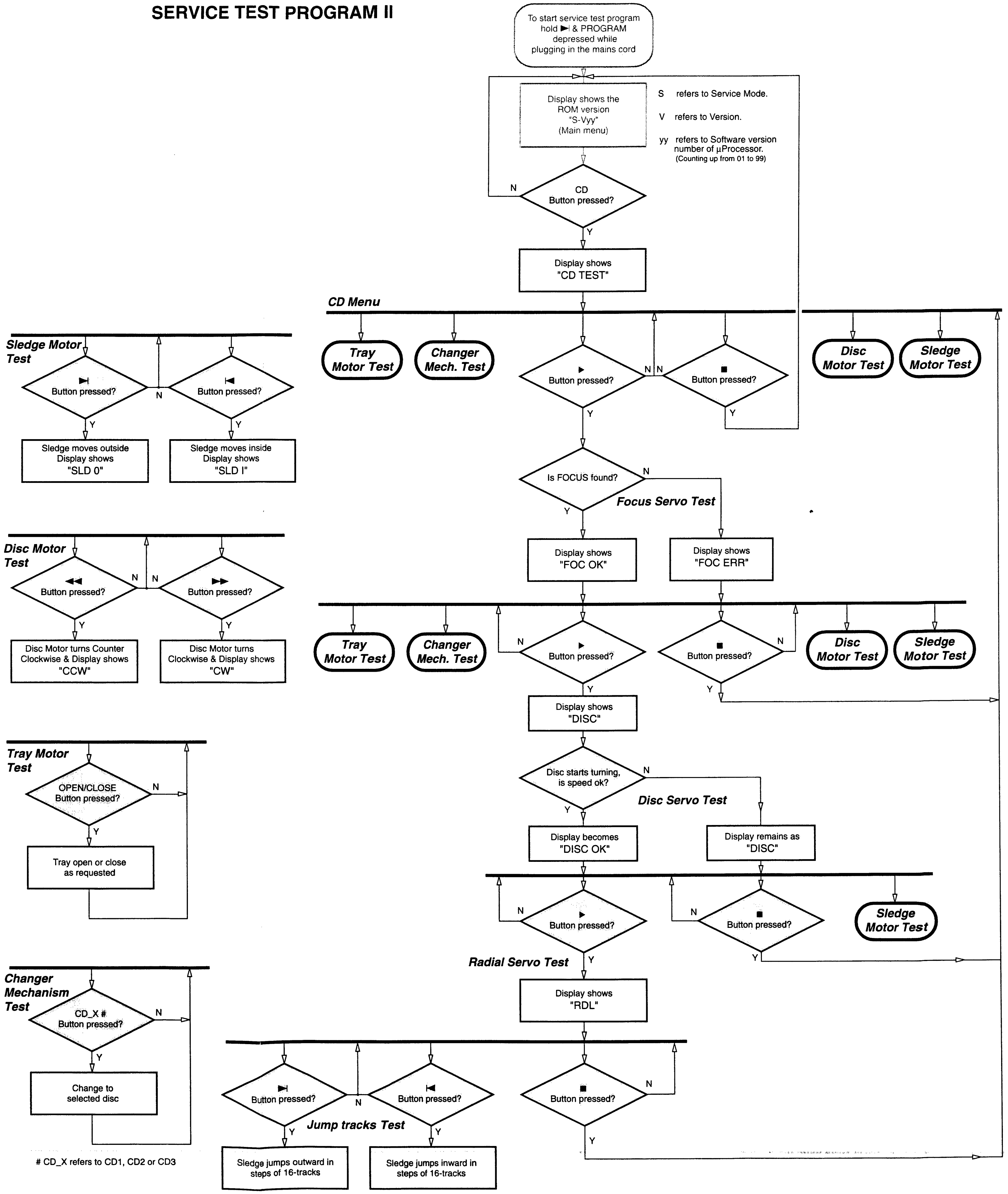
Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	CLOCK /TIMER	10	RECORD *	21
Any Remote control key	RC	PROGRAM	11	REPLAY *	22
CD1 *	1	INCRSURROUND *	12	◄◄	23
CD2 *	2	VOLUME UP *	13	►►	24
CD3 *	3	VOLUME DOWN *	14	■	Exit
CHANGE CD	4	STANDBY - ON	15	►II	26
OPEN / CLOSE	5	CD	16	I◄	27
DSC	6	TUNER	17	►I	28
DBB	7	TAPE	18		
RDS *	8	AUX	19		
NEWS *	9	HSD	20		

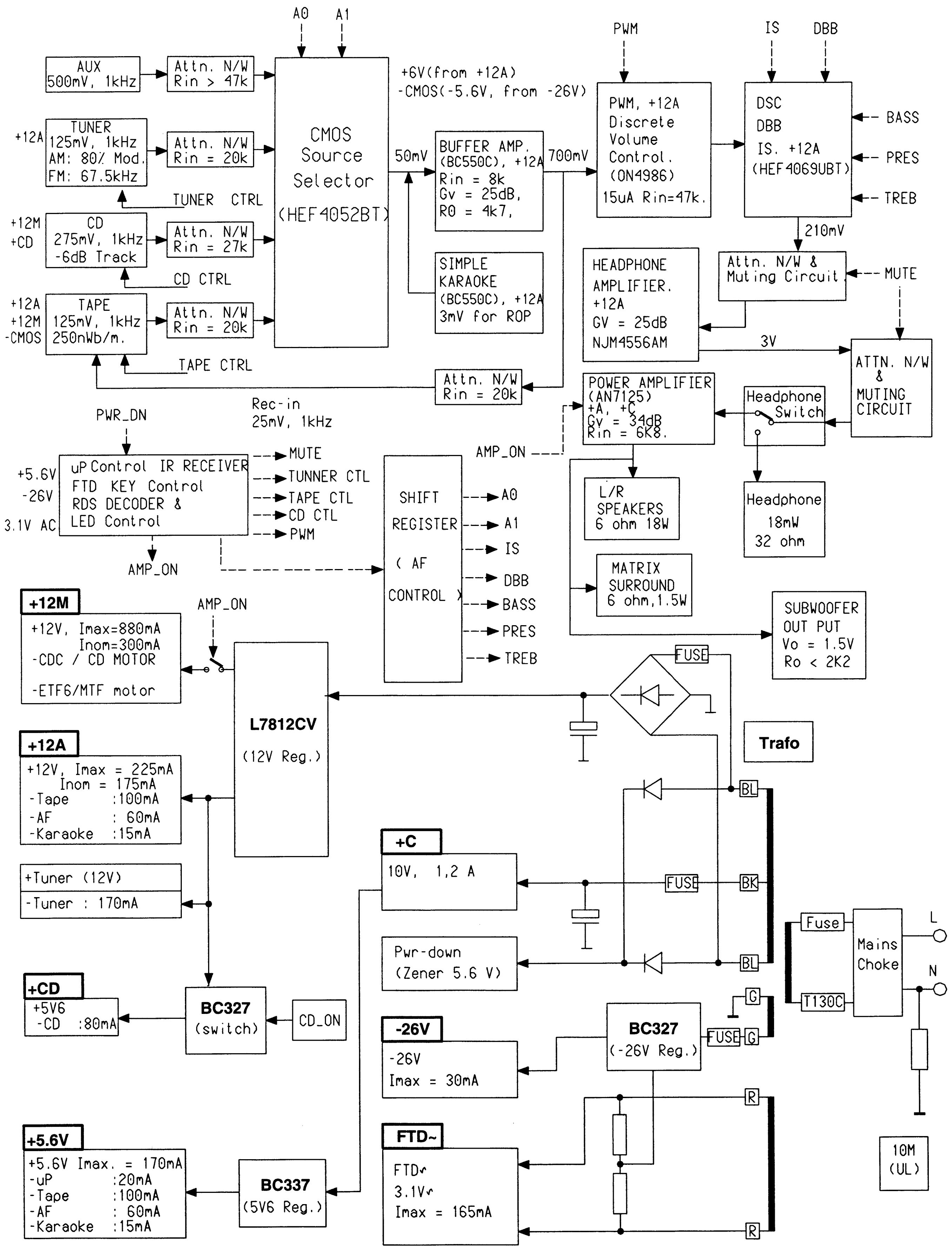
* Not for all type/version

Table 3

SERVICE TEST PROGRAM II

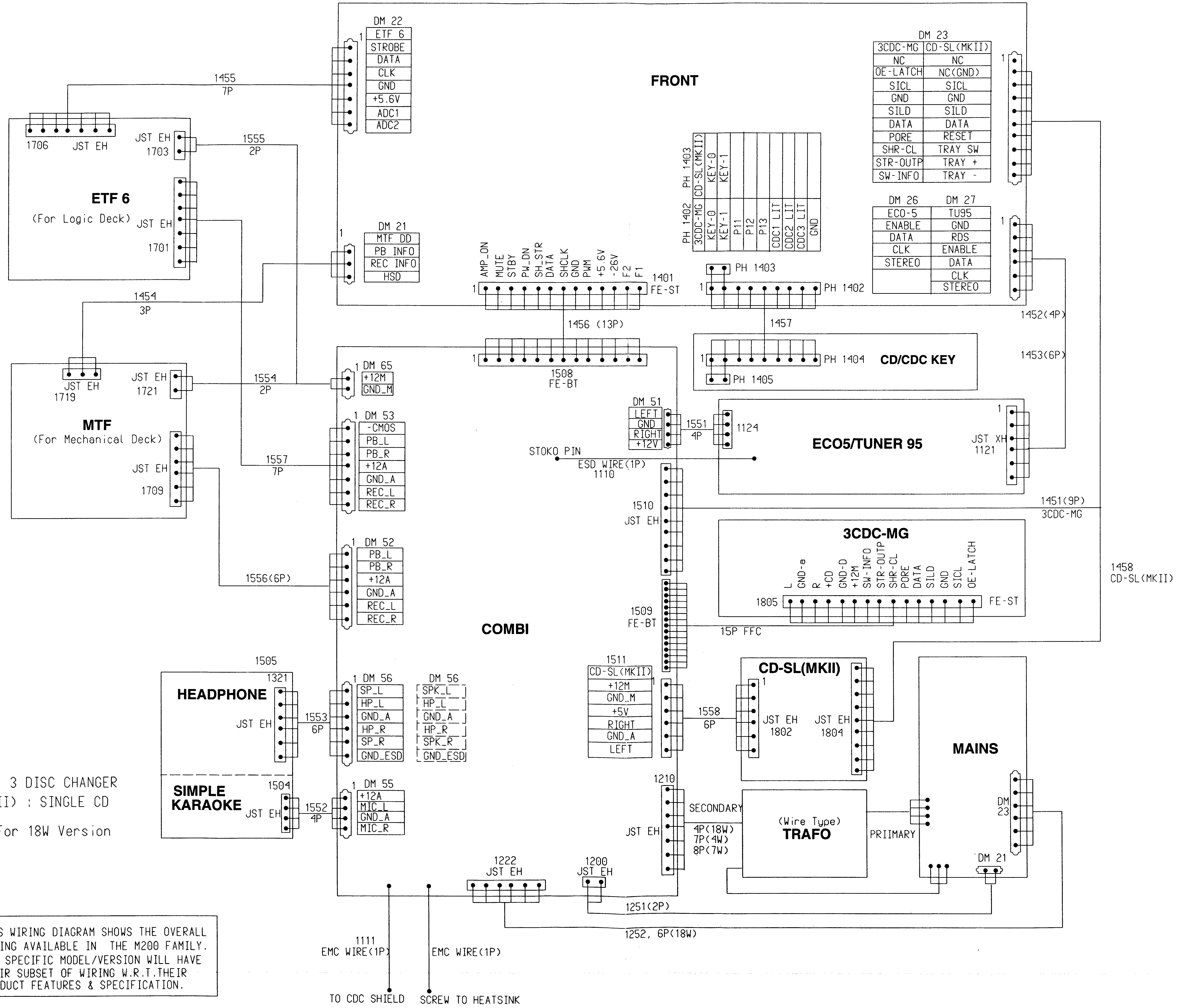

To start service test program hold ►I & PROGRAM depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
S refers to Service Mode.
V refers to Version.
yy refers to Software version number of µProcessor. (Counting up from 01 to 99)
CD Button pressed?
N
Y
Display shows "CD TEST"
CD Menu
Tray Motor Test
Changer Mech. Test
► Button pressed?
■ Button pressed?
N
N
Y
Y
Disc Motor Test
Sledge Motor Test
Is FOCUS found?
N
Y
Focus Servo Test
Display shows "FOC OK"
Display shows "FOC ERR"
Tray Motor Test
Changer Mech. Test
► Button pressed?
■ Button pressed?
N
N
Y
Y
Disc Motor Test
Sledge Motor Test
Display shows "DISC"
Disc starts turning, is speed ok?
N
Y
Disc Servo Test
Display becomes "DISC OK"
Display remains as "DISC"
► Button pressed?
■ Button pressed?
N
N
Y
Y
Sledge Motor Test
Radial Servo Test
Display shows "RDL"
►I Button pressed?
I◄ Button pressed?
■ Button pressed?
N
N
Y
Y
Y
Jump tracks Test
Sledge jumps outward in steps of 16-tracks
Sledge jumps inward in steps of 16-tracks
Sledge Motor Test
►I Button pressed?
I◄ Button pressed?
N
Y
Y
Sledge moves outside Display shows "SLD 0"
Sledge moves inside Display shows "SLD I"
Disc Motor Test
◄◄ Button pressed?
►► Button pressed?
N
N
Y
Y
Disc Motor turns Counter Clockwise & Display shows "CCW"
Disc Motor turns Clockwise & Display shows "CW"
Tray Motor Test
OPEN/CLOSE Button pressed?
N
Y
Tray open or close as requested
Changer Mechanism Test
CD_X # Button pressed?
N
Y
Change to selected disc
# CD_X refers to CD1, CD2 or CD3

SET BLOCK DIAGRAM


A0
A1
AUX
500mV, 1kHz
Attn. N/W
Rin > 47k
+12A
TUNER
125mV, 1kHz
AM: 80% Mod.
FM: 67.5kHz
Attn. N/W
Rin = 20k
TUNER CTRL
+12M
+CD
CD
275mV, 1kHz
-6dB Track
Attn. N/W
Rin = 27k
CD CTRL
+12A
+12M
-CMOS
TAPE
125mV, 1kHz
250nWb/m.
Attn. N/W
Rin = 20k
TAPE CTRL
CMOS
Source
Selector
(HEF4052BT)
+6V(from +12A)
-CMOS(-5.6V, from -26V)
50mV
BUFFER AMP.
(BC550C), +12A
Rin = 8k
Gv = 25dB,
R0 = 4k7,
700mV
SIMPLE
KARAOKE
(BC550C), +12A
3mV for ROP
Attn. N/W
Rin = 20k
Rec-in
25mV, 1kHz
PWM
PWM, +12A
Discrete
Volume
Control.
(ON4986)
15uA Rin=47k.
IS
DBB
DSC
DBB
IS. +12A
(HEF4069UBT)
BASS
PRES
TREB
210mV
Attn. N/W &
Muting Circuit
MUTE
HEADPHONE
AMPLIFIER.
+12A
GV = 25dB
NJM4556AM
3V
ATTN. N/W
&
MUTING
CIRCUIT
POWER AMPLIFIER
(AN7125)
+A, +C
Gv = 34dB
Rin = 6K8.
Headphone
Switch
AMP_ON
L/R
SPEAKERS
6 ohm 18W
Headphone
18mW
32 ohm
MATRIX
SURROUND
6 ohm,1.5W
SUBWOOFER
OUT PUT
Vo = 1.5V
Ro < 2K2
PWR_DN
+5.6V
-26V
3.1V AC
uP Control IR RECEIVER
FTD KEY Control
RDS DECODER &
LED Control
MUTE
TUNNER CTL
TAPE CTL
CD CTL
PWM
AMP_ON
SHIFT
REGISTER
(AF
CONTROL)
A0
A1
IS
DBB
BASS
PRES
TREB
+12M
+12V, Imax=880mA
Inom=300mA
-CDC / CD MOTOR
-ETF6/MTF motor
AMP_ON
L7812CV
(12V Reg.)
FUSE
Trafo
+12A
+12V, Imax = 225mA
Inom = 175mA
-Tape :100mA
-AF : 60mA
-Karaoke :15mA
+Tuner (12V)
-Tuner : 170mA
BL
BK
FUSE
BL
+C
10V, 1,2 A
Pwr-down
(Zener 5.6 V)
Fuse
T130C
Mains
Choke
L
N
+CD
+5V6
-CD :80mA
BC327
(switch)
CD_ON
-26V
-26V
Imax = 30mA
BC327
(-26V Reg.)
FUSE
G
G
R
R
FTD~
FTD~
3.1V~
Imax = 165mA
+5.6V
+5.6V Imax. = 170mA
-uP :20mA
-Tape :100mA
-AF : 60mA
-Karaoke :15mA
BC337
(5V6 Reg.)
10M
(UL)

NOTES:

SET WIRING DIAGRAM


FRONT
DM 22
ETF 6
STROBE
DATA
CLK
GND
+5.6V
ADC1
ADC2
1455
7P
1706
JST EH
JST EH
1703
1555
2P
ETF 6
(For Logic Deck)
JST EH
1701
DM 21
MTF DD
PB INFO
REC INFO
HSD
1454
3P
AMP_ON
MUTE
STBY
PW_DN
SH_STR
DATA
SHCLK
GND
PWM
+5.6V
-26V
F2
F1
1401
FE-ST
PH 1403
3CDC-MG
CD-SL(MKII)
KEY-0
KEY-1
PH 1402
P11
P12
P13
CDC1 LIT
CDC2 LIT
CDC3 LIT
GND
PH 1403
PH 1402
DM 23
3CDC-MG
CD-SL(MKII)
NC
OE-LATCH
NC(GND)
SICL
GND
SILD
DATA
PORE
RESET
SHR-CL
TRAY SW
STR-OUTP
TRAY +
SW-INFO
TRAY -
DM 26
DM 27
ECO-5
TU95
ENABLE
GND
RDS
CLK
STEREO
1452(4P)
1453(6P)
1456 (13P)
1457
1508
FE-BT
PH 1404
CD/CDC KEY
PH 1405
JST EH
1719
JST EH
1721
MTF
(For Mechanical Deck)
1554
2P
DM 65
+12M
GND_M
DM 53
-CMOS
PB_L
PB_R
+12A
GND_A
REC_L
REC_R
1557
7P
JST EH
1709
DM 51
LEFT
GND
RIGHT
+12V
1551
4P
1124
ECO5/TUNER 95
JST XH
1121
STOKO PIN
ESD WIRE(1P)
1110
1510
JST EH
1451(9P)
3CDC-MG
3CDC-MG
L
GND-a
R
+CD
GND-D
+12M
SW-INFO
STR-OUTP
SHR-CL
PORE
DATA
SILD
GND
SICL
OE-LATCH
1805
FE-ST
1458
CD-SL(MKII)
DM 52
1556(6P)
1509
FE-BT
15P FFC
COMBI
1505
1321
HEADPHONE
JST EH
1553
6P
DM 56
SP_L
HP_L
GND_A
HP_R
SP_R
GND_ESD
SPK_L
SPK_R
1511
CD-SL(MKII)
+12M
GND_M
+5V
RIGHT
GND_A
LEFT
1558
6P
CD-SL(MKII)
JST EH
1802
JST EH
1804
MAINS
SIMPLE KARAOKE
1504
JST EH
1552
4P
DM 55
+12A
MIC_L
GND_A
MIC_R
1210
JST EH
SECONDARY
4P(18W)
7P(4W)
8P(7W)
(Wire Type)
TRAFO
PRIIMARY
DM 23
DM 21
1222
JST EH
1200
JST EH
1251(2P)
1252, 6P(18W)
1111
EMC WIRE(1P)
EMC WIRE(1P)
TO CDC SHIELD
SCREW TO HEATSINK

3CDC-MG : 3 DISC CHANGER
CD-SL(MKII) : SINGLE CD
[- - -] : For 18W Version

NB : THIS WIRING DIAGRAM SHOWS THE OVERALL WIRING AVAILABLE IN THE M200 FAMILY. THE SPECIFIC MODEL/VERSION WILL HAVE THEIR SUBSET OF WIRING W.R.T.THEIR PRODUCT FEATURES & SPECIFICATION.

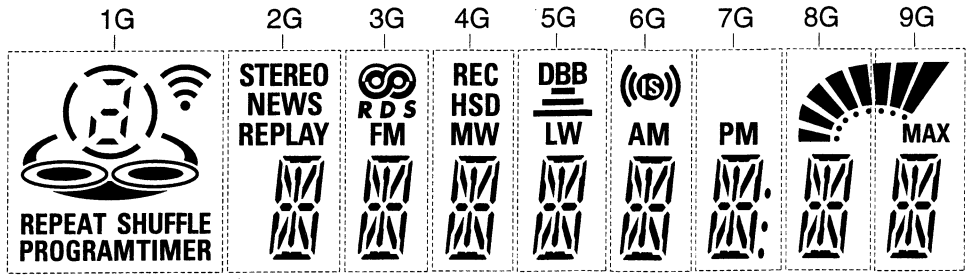
FRONT BOARD

TABLE OF CONTENTS

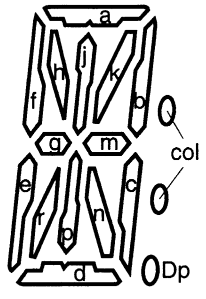
LCD pin connection 6-1
Component & Chip layout 6-2
Circuit diagram.. 6-3
Electrical parts list.. 6-4

NOTE

LCD DISPLAY PIN CONNECTIONS

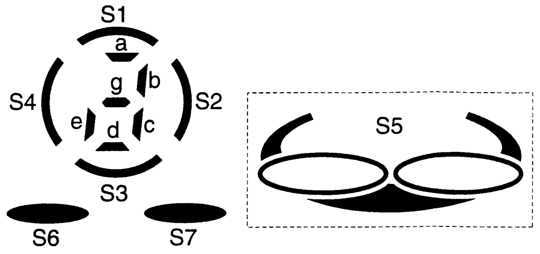


1G
2G
3G
4G
5G
6G
7G
8G
9G
STEREO
NEWS
REPLAY
RDS
FM
REC
HSD
MW
DBB
LW
AM
PM
MAX
REPEAT SHUFFLE
PROGRAMTIMER



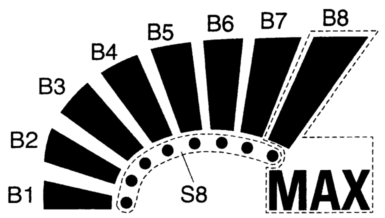
a
h
j
k
f
b
col
g
m
e
c
r
p
n
d
Dp

(2G~9G)



S1
a
S4
g
b
S2
e
d
c
S3
S5
S6
S7

(1G)

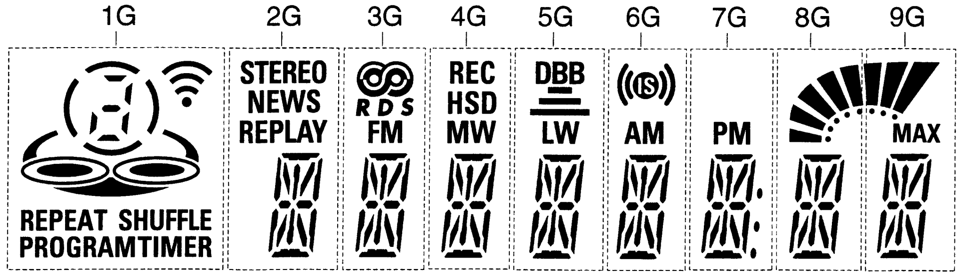


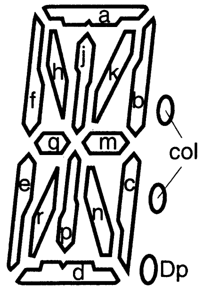
B1
B2
B3
B4
B5
B6
B7
B8
S8
MAX

(8G , 9G)

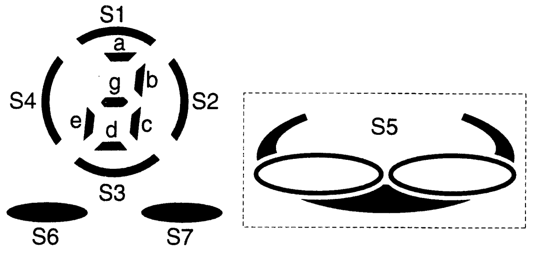
	1G	2G	3G	4G	5G	6G	7G	8G	9G
P1	S1	a	a	a	a	a	a	a	a
P2	S2	h	h	h	h	h	h	h	h
P3	S3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	k	k	k	k	k	k	k	k
P5	b	b	b	b	b	b	b	b	b
P6	c	f	f	f	f	f	f	f	f
P7	a , d , g	m	m	m	m	m	m	m	m
P8	e	g	g	g	g	g	g	g	g
P9	S5	c	c	c	c	c	c	c	c
P10	S6	e	e	e	e	e	e	e	e
P11	S7	r	r	r	r	r	r	r	r
P12	**SHUFFLE**	n	n	n	n	n	n	n	n
P13	**REPEAT**	d	d	d	d	d	d	d	d
P14	**TIMER**	**STEREO**	**RDS**	**REC**	**DBB**	**IS**	**PM**	S8	
P15	**PROGRAM**	**REPLAY**	**FM**	**HSD**	≡	**( )**	col	B5	
P16	📶	**NEWS**	-	**MW**	**LW**	**AM**	Dp	B6	
P17	-	-	-	-	-	-	-	B1	-
P18	-	-	-	-	-	-	-	B2	-
P19	-	-	-	-	-	-	-	B3	-
P20	-	-	-	-	-	-	-	B4	-
P21	-	-	-	-	-	-	-	-	B7
P22	-	-	-	-	-	-	-	-	B8

LCD DISPLAY PIN CONNECTIONS

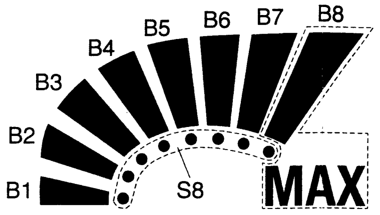

1G
2G
3G
4G
5G
6G
7G
8G
9G
STEREO
NEWS
REPLAY
RDS
FM
REC
HSD
MW
DBB
LW
AM
PM
MAX
REPEAT SHUFFLE
PROGRAMTIMER


a
h
j
k
b
f
g
m
col
e
r
p
n
c
d
Dp

(2G~9G)


S1
a
S4
g
b
S2
e
d
c
S3
S5
S6
S7

(1G)


B8
B7
B6
B5
B4
B3
B2
B1
S8
MAX

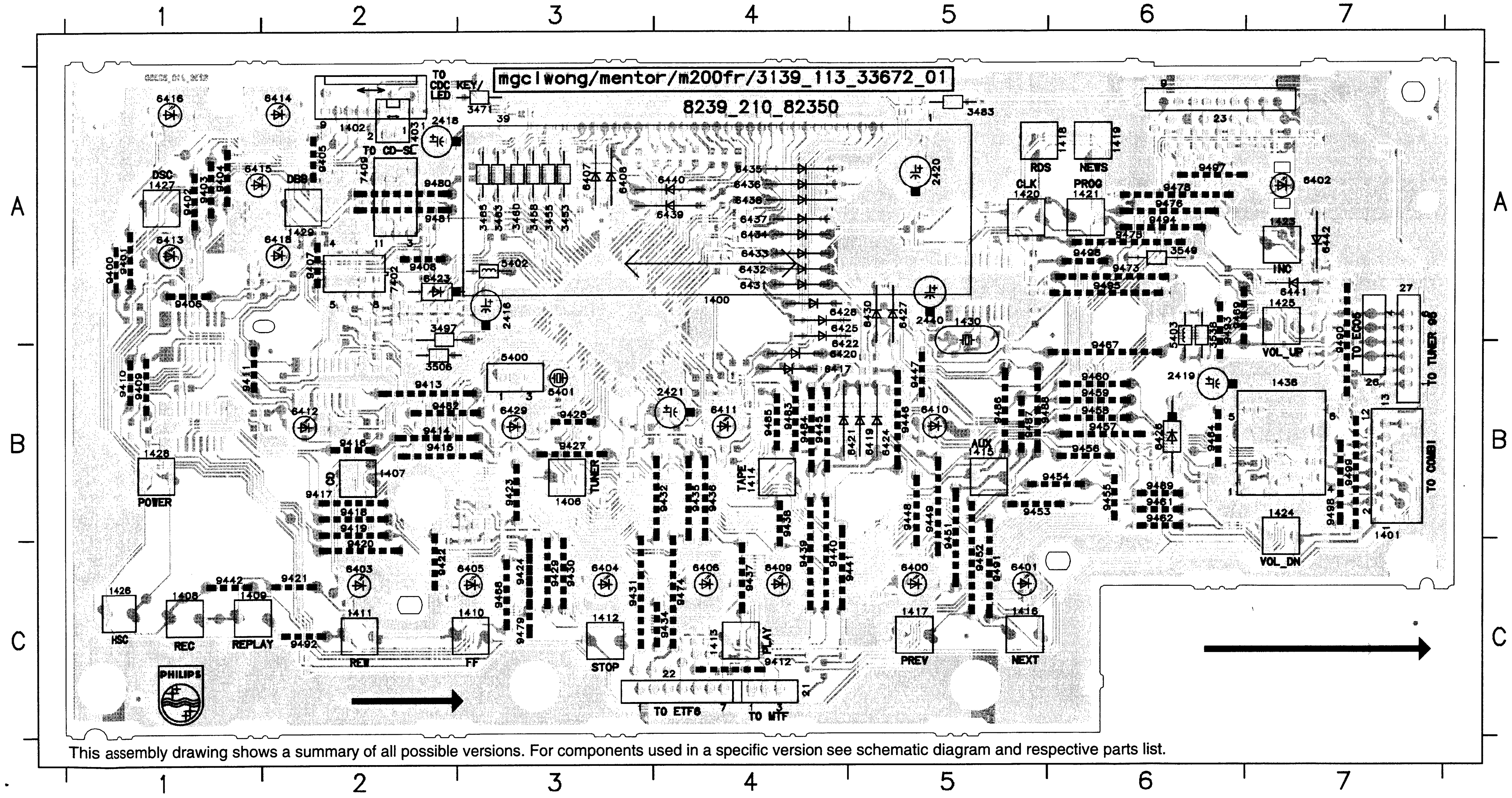
(8G , 9G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G
P1	S1	a	a	a	a	a	a	a	a
P2	S2	h	h	h	h	h	h	h	h
P3	S3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	k	k	k	k	k	k	k	k
P5	b	b	b	b	b	b	b	b	b
P6	c	f	f	f	f	f	f	f	f
P7	a , d , g	m	m	m	m	m	m	m	m
P8	e	g	g	g	g	g	g	g	g
P9	S5	c	c	c	c	c	c	c	c
P10	S6	e	e	e	e	e	e	e	e
P11	S7	r	r	r	r	r	r	r	r
P12	**SHUFFLE**	n	n	n	n	n	n	n	n
P13	**REPEAT**	d	d	d	d	d	d	d	d
P14	**TIMER**	**STEREO**	**RDS**	**REC**	**DBB**	**IS**	**PM**	S8	
P15	**PROGRAM**	**REPLAY**	**FM**	**HSD**	≡	(( ))	col	B5	
P16	📶	**NEWS**	-	**MW**	**LW**	**AM**	Dp	B6	
P17	-	-	-	-	-	-	-	B1	-
P18	-	-	-	-	-	-	-	B2	-
P19	-	-	-	-	-	-	-	B3	-
P20	-	-	-	-	-	-	-	B4	-
P21	-	-	-	-	-	-	-	-	B7
P22	-	-	-	-	-	-	-	-	B8

NOTES:

COMPONENT LAYOUT

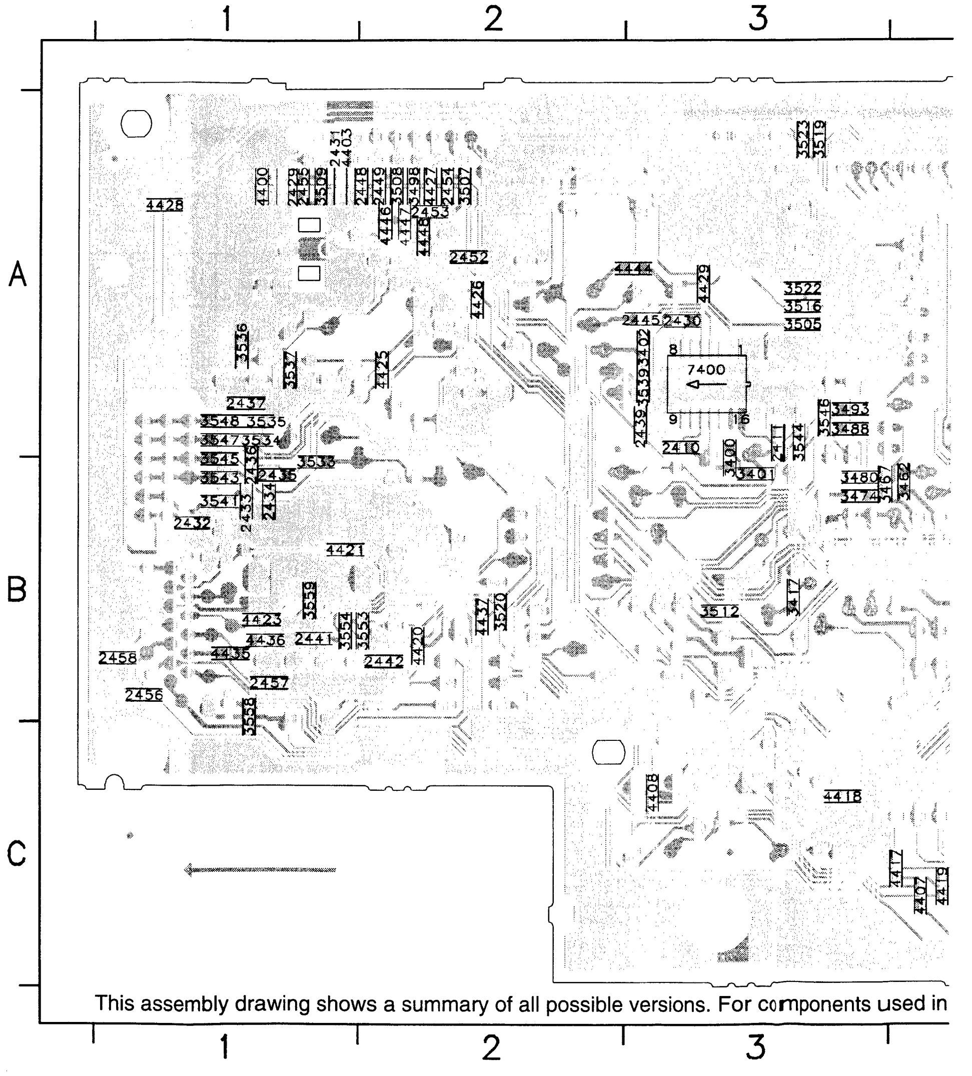
21	C4	1407	B2	1417	C5	1428	B1	3453	A3	3538	A6	6404	C3	6414	A2	6424	B5	6434	A4	7409	A2	9409	B1	9419	B2	9431	C3	9442	C1	9455	B6	9468	C3	9482	B2	9492	C2
22	C4	1408	C1	1418	A6	1429	A2	3455	A3	3549	A6	6405	C3	6415	A1	6425	A4	6435	A4	9400	A1	9410	B1	9420	C2	9432	B4	9445	B4	9456	B6	9469	A6	9483	B4	9493	A6
23	A6	1409	C1	1419	A6	1430	A5	3458	A3	5400	B3	6406	C4	6416	A1	6426	B6	6436	A4	9401	A1	9411	B1	9421	C2	9434	C4	9446	B5	9457	B6	9473	A6	9484	B4	9494	A6
26	B7	1410	C3	1420	A5	1436	B7	3460	A3	5401	B3	6407	A3	6417	B4	6427	A5	6437	A4	9402	A1	9412	C4	9422	C2	9435	B4	9447	B5	9458	B6	9474	C4	9485	B4	9495	A6
27	A7	1411	C2	1421	A6	2416	A3	3463	A3	5402	A3	6408	A3	6418	A2	6428	A4	6438	A4	9403	A1	9413	B2	9423	B3	9436	B4	9448	B5	9459	B6	9475	A6	9486	B5	9496	A6
1400	A4	1412	C3	1423	A7	2418	A2	3465	A3	5403	A6	6409	C4	6419	B5	6429	B3	6439	A4	9404	A1	9414	B2	9424	C3	9437	C4	9449	B5	9460	B6	9476	A6	9487	B5	9497	A6
1401	B7	1413	C4	1424	B7	2419	B6	3471	A3	6400	C5	6410	B5	6420	B4	6430	A5	6440	A4	9405	A2	9415	B2	9427	B3	9438	B4	9451	B5	9461	B6	9478	A6	9488	B5	9498	B7
1402	A2	1414	B4	1425	A7	2420	A5	3483	A5	6401	C5	6411	B4	6421	B5	6431	A4	6441	A7	9406	A1	9416	B2	9428	B3	9439	C4	9452	C5	9462	B6	9479	C3	9489	B6	9499	B7
1403	A2	1415	B5	1426	C1	2421	B4	3497	A2	6402	A7	6412	B2	6422	B4	6432	A4	6442	A7	9407	A2	9417	B2	9429	C3	9440	C4	9453	B5	9464	B6	9480	A2	9490	A7		
1406	B3	1416	C5	1427	A1	2440	A5	3506	B2	6403	C2	6413	A1	6423	A2	6433	A4	7402	A2	9408	A2	9418	B2	9430	C3	9441	C5	9454	B6	9467	B6	9481	A2	9491	C5		


1
2
3
4
5
6
7
A
B
C
mgclwong/mentor/m200fr/3139_113_33672_01
8239_210_82350
TO CDC
KEY/LED
TO CD-SL
DSC
DBB
POWER
HSC
REC
REPLAY
REW
FF
STOP
PLAY
TAPE
TUNER
CD
AUX
PREV
NEXT
CLK
RDS
NEWS
PROG
INC
VOL_UP
VOL_DN
TO ECO6
TO TUNER 06
TO COMBI
TO ETF6
TO MTF
PHILIPS

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

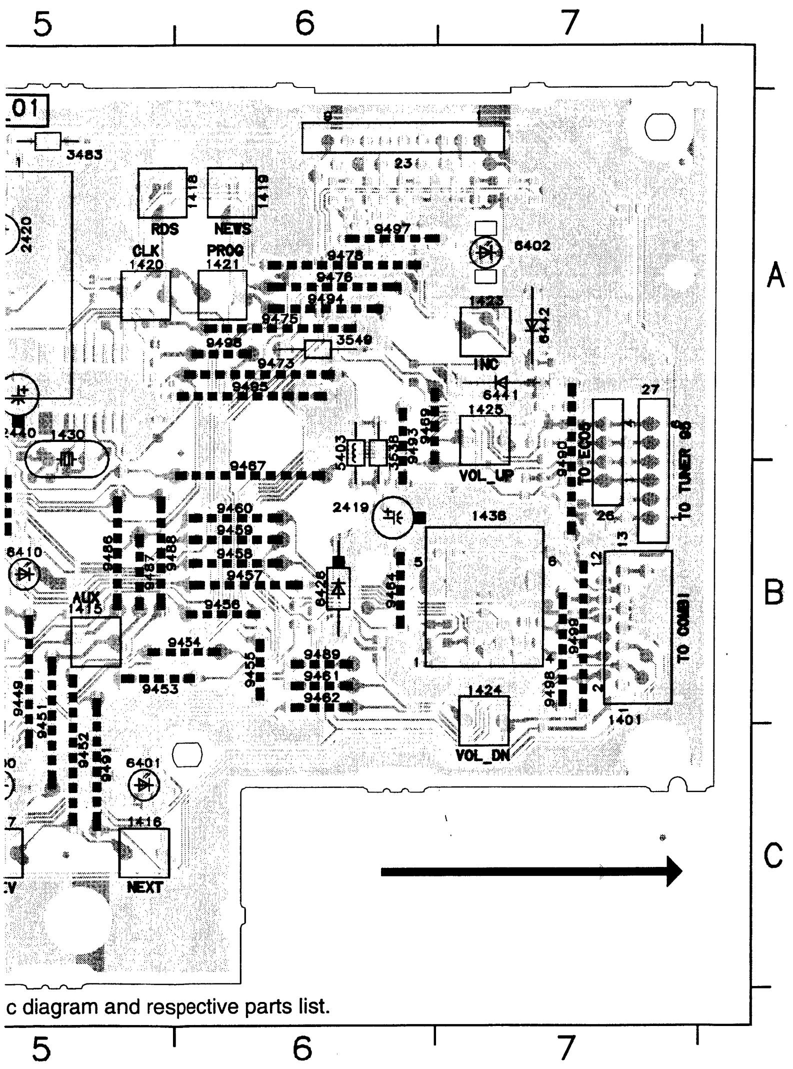
CHIP LAYOUT

2408	B5	2427	A6	2441	B1	2457	B1	3411	B6	3424	A4	3437	A4	3449	A7	3474	B3
2409	B5	2428	B5	2442	B2	2458	B1	3412	A6	3425	A4	3438	A4	3451	A7	3475	B5
2410	A3	2429	A1	2443	B5	3400	B3	3413	B6	3426	A4	3439	A4	3452	A7	3476	A5
2411	A3	2430	A3	2444	A6	3401	B3	3414	A6	3427	A4	3440	A4	3454	B4	3477	B4
2412	B7	2431	A1	2445	A3	3402	A3	3415	A6	3428	A4	3441	A4	3456	B4	3478	A5
2414	A6	2432	B1	2448	A2	3403	B6	3416	B6	3429	A4	3442	A4	3457	A7	3479	B4
2415	B4	2433	B1	2449	A2	3405	A6	3417	B3	3430	A4	3443	A4	3459	B4	3480	B3
2422	C5	2434	B1	2452	A2	3406	A6	3419	B4	3431	B4	3444	A4	3462	B4	3481	A6
2423	B5	2435	B1	2453	A2	3407	B7	3420	A5	3433	B7	3445	A4	3464	B4	3482	B4
2424	B5	2436	B1	2454	A2	3408	B6	3421	A4	3434	A5	3446	B4	3467	B3	3484	A6
2425	B5	2437	A1	2455	A1	3409	B6	3422	A4	3435	A5	3447	B4	3469	A5	3485	B4
2426	A6	2439	A3	2456	B1	3410	A6	3423	A4	3436	A5	3448	A7	3472	A5	3486	A6


1
2
3
A
B
C
7400
4428
4444
4421
2452
2437
2456
4418

This assembly drawing shows a summary of all possible versions. For components used in

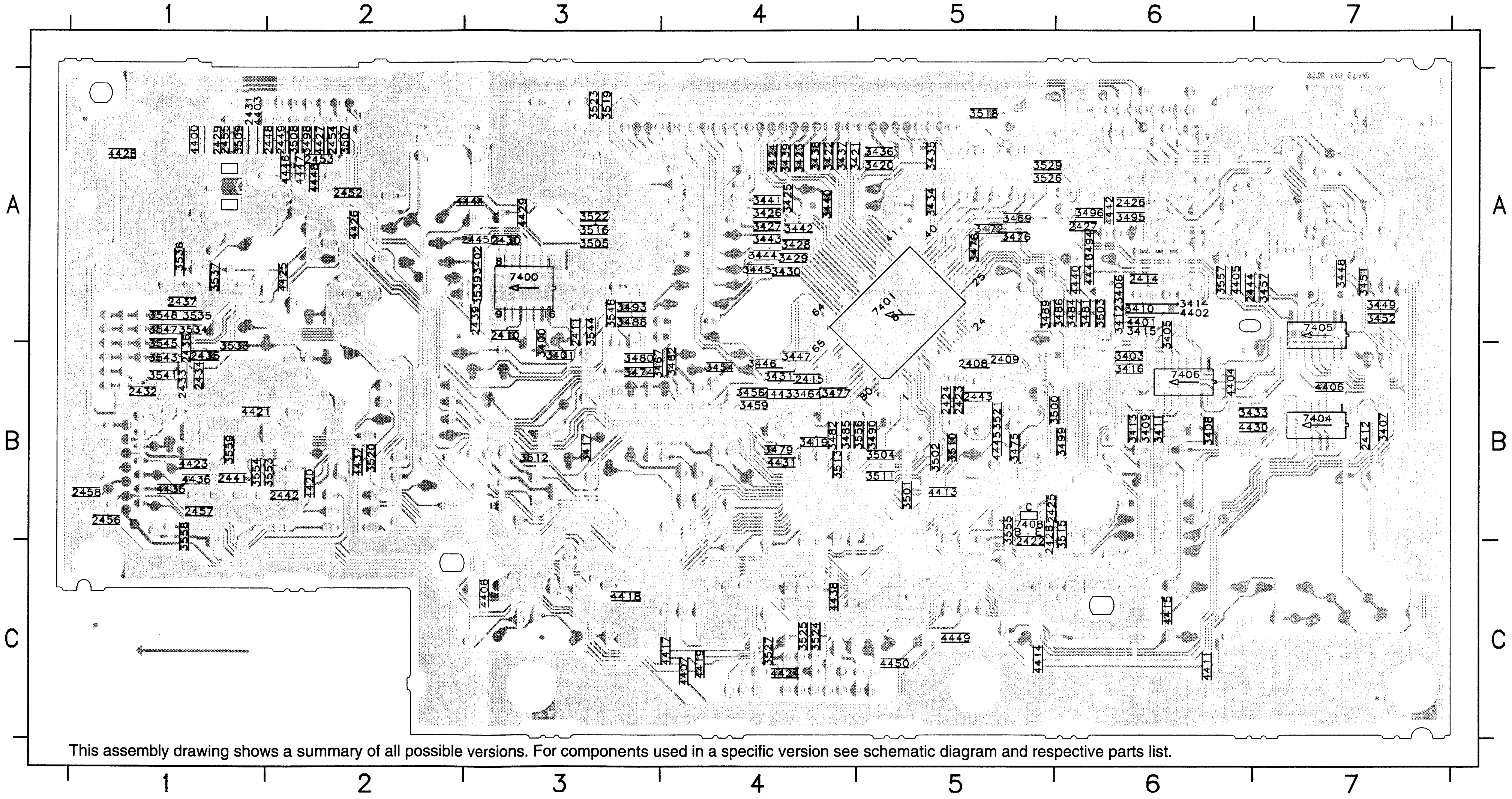
B1	9419	B2	9431	C3	9442	C1	9455	B6	9468	C3	9482	B2	9492	C2
B1	9420	C2	9432	B4	9445	B4	9456	B6	9469	A6	9483	B4	9493	A6
B1	9421	C2	9434	C4	9446	B5	9457	B6	9473	A6	9484	B4	9494	A6
C4	9422	C2	9435	B4	9447	B5	9458	B6	9474	C4	9485	B4	9495	A6
B2	9423	B3	9436	B4	9448	B5	9459	B6	9475	A6	9486	B5	9496	A6
B2	9424	C3	9437	C4	9449	B5	9460	B6	9476	A6	9487	B5	9497	A6
B2	9427	B3	9438	B4	9451	B5	9461	B6	9478	A6	9488	B5	9498	B7
B2	9428	B3	9439	C4	9452	C5	9462	B6	9479	C3	9489	B6	9499	B7
B2	9429	C3	9440	C4	9453	B5	9464	B6	9480	A2	9490	A7		
B2	9430	C3	9441	C5	9454	B6	9467	B6	9481	A2	9491	C5		



c diagram and respective parts list.

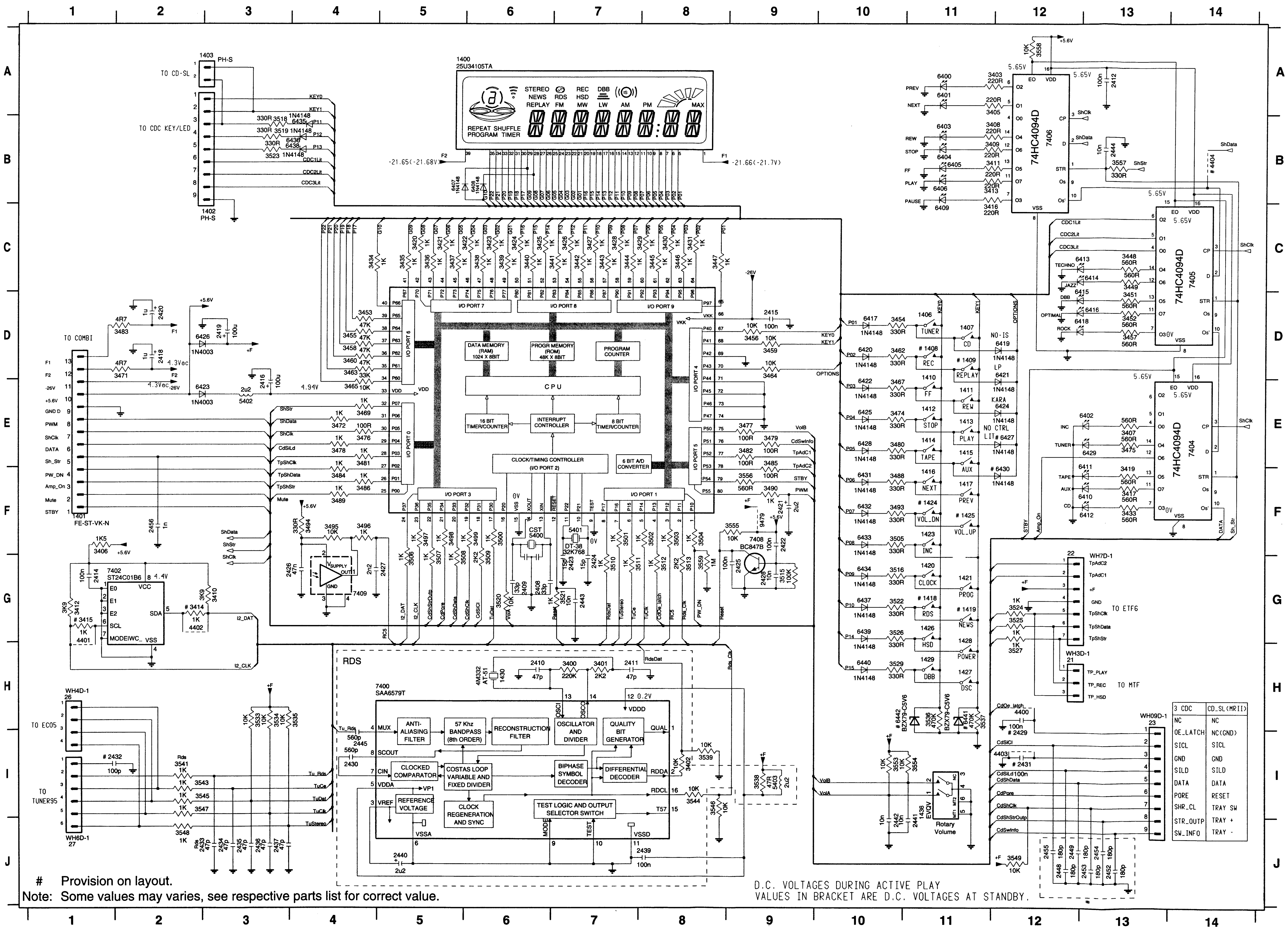
CHIP LAYOUT

2408	B5	2427	A6	2441	B1	2457	B1	3411	B6	3424	A4	3437	A4	3449	A7	3474	B3	3488	A3	3503	A6	3518	A5	3534	A1	3553	B2	4405	A6	4421	B1	4437	B2	4450	C5
2409	B5	2428	B5	2442	B2	2458	B1	3412	A6	3425	A4	3438	A4	3451	A7	3475	B5	3489	A5	3504	B5	3519	A3	3535	A1	3554	B1	4406	B7	4423	B1	4438	C4	7400	A3
2410	A3	2429	A1	2443	B5	3400	B3	3413	B6	3426	A4	3439	A4	3452	A7	3476	A5	3490	B5	3505	A3	3520	B2	3536	A1	3555	B5	4407	C4	4424	C4	4440	A6	7401	A5
2411	A3	2430	A3	2444	A6	3401	B3	3414	A6	3427	A4	3440	A4	3454	B4	3477	B4	3493	A3	3507	A2	3521	B5	3537	A1	3556	B5	4408	C3	4425	A2	4441	A6	7404	B7
2412	B7	2431	A1	2445	A3	3402	A3	3415	A6	3428	A4	3441	A4	3456	B4	3478	A5	3494	A6	3508	A2	3522	A3	3539	A3	3557	A6	4411	C6	4426	A2	4442	A6	7405	A7
2414	A6	2432	B1	2448	A2	3403	B6	3416	B6	3429	A4	3442	A4	3457	A7	3479	B4	3495	A6	3509	A1	3523	A3	3541	B1	3558	B1	4413	B5	4427	A2	4443	B4	7406	B6
2415	B4	2433	B1	2449	A2	3405	A6	3417	B3	3430	A4	3443	A4	3459	B4	3480	B3	3496	A6	3510	B5	3524	C4	3543	B1	3559	B1	4414	C5	4428	A1	4444	A3	7408	B5
2422	C5	2434	B1	2452	A2	3406	A6	3419	B4	3431	B4	3444	A4	3462	B4	3481	A6	3498	A2	3511	B5	3525	C4	3544	A3	4400	A1	4415	C6	4429	A3	4445	B5		
2423	B5	2435	B1	2453	A2	3407	B7	3420	A5	3433	B7	3445	A4	3464	B4	3482	B4	3499	B6	3512	B3	3526	A5	3545	B1	4401	A6	4417	C4	4430	B7	4446	A2		
2424	B5	2436	B1	2454	A2	3408	B6	3421	A4	3434	A5	3446	B4	3467	B3	3484	A6	3500	B5	3513	B4	3527	C4	3546	A3	4402	A6	4418	C3	4431	B4	4447	A2		
2425	B5	2437	A1	2455	A1	3409	B6	3422	A4	3435	A5	3447	B4	3469	A5	3485	B4	3501	B5	3515	B6	3529	A5	3547	A1	4403	A1	4419	C4	4435	B1	4448	A2		
2426	A6	2439	A3	2456	B1	3410	A6	3423	A4	3436	A5	3448	A7	3472	A5	3486	A6	3502	B5	3516	A3	3533	B1	3548	A1	4404	B6	4420	B2	4436	B1	4449	C5		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CIRCUIT DIAGRAM


1400
25U34105TA
STEREO NEWS RDS REC HSD DBB
REPLAY FM MW LW AM PM MAX
REPEAT SHUFFLE PROGRAM TIMER
1403 PH-S
TO CD-SL
TO CDC KEY/LED
1402 PH-S
KEY0
KEY1
P11
P12
P13
CDC1Lit
CDC2Lit
CDC3Lit
F2
F1
-21.65(-21.68V)
-21.66(-21.7V)
TO COMBI
1401 FE-ST-VK-N
F1
F2
-26V
+5.6V
GND D
PWM
ShClk
DATA
Sh_Str
PW_DN
Amp_On
Mute
STBY
4.3Vac
4.94V
VDD
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024 X 8BIT
PROGR MEMORY (ROM) 48K X 8BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D CONVERTER
VKK
OPTIONS
VolB
CdSwInfo
TpAdC1
TpAdC2
STBY
PWM
ShStr
ShData
ShClk
CdSiLd
TpShClk
TpShData
TpShStr
Mute
7402
ST24C01B6
MODE/WC_
7409
7408
BC847B
CST 5400
5401 DT-38 32K768
RDS
7400
SAA6579T
4M332 AT-51
1430
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
MUX
SCOUT
CIN
VDDA
VREF
VSSA
VDDD
VSSD
QUAL
RDDA
RDCL
T57
MODE
TEST
WH4D-1
TO EC05
TO TUNER95
WH6D-1
Tu_Rds
TuCe
TuDat
TuClk
TuStereo
74HC4094D
7406
7405
7404
PREV
NEXT
REW
STOP
FF
PLAY
PAUSE
TECHNO
JAZZ
DBB
OPTIMAL
ROCK
INC
TUNER
TAPE
AUX
CD
TUNER
CD
REC
REPLAY
FF
REW
STOP
PLAY
TAPE
AUX
NEXT
PREV
VOL_DN
VOL_UP
INC
CLOCK
PROG
RDS
NEWS
HSD
POWER
DBB
DSC
NO-IS
LP
KARA
NO CTRL LIT
WH7D-1
TO ETF6
WH3D-1
TO MTF
TP_PLAY
TP_REC
TP_HSD
1436 EVQV
Rotary Volume
WH09D-1
3 CDC
CD_SL(MRII)
NC
NC
OE_LATCH
NC(GND)
SICL
SICL
GND
GND
SILD
SILD
DATA
DATA
PORE
RESET
SHR_CL
TRAY SW
STR_OUTP
TRAY +
SW_INFO
TRAY -
1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H I J

Provision on layout.

Note: Some values may varies, see respective parts list for correct value.

D.C. VOLTAGES DURING ACTIVE PLAY
VALUES IN BRACKET ARE D.C. VOLTAGES AT STANDBY.

21	H12
22	G12
23	H13
26	H1
27	J1
1400	A5
1401	F1
1402	C2
1403	A2
1406	D11
1407	D11
1408	D11
1409	D11
1410	E11
1411	E11
1412	E11
1413	E11
1414	E11
1415	E11
1416	F11
1417	F11
1418	G11
1419	G11
1420	G11
1421	G11
1423	F11
1424	F11
1425	F11
1426	G11
1427	H11
1428	H11
1429	H11
1430	H6
1436	J11
2408	G6
2409	G6
2410	H6
2411	H7
2412	A13
2414	G1
2415	D9
2416	E3
2418	D2
2419	D3
2420	D2
2421	F9
2422	F9
2423	G7
2424	G7
2425	G9
2426	G3
2427	G5
2428	G9
2429	I12
2430	I4
2431	I12
2432	I1
2433	J2
2434	J3
2435	J3
2436	J3
2437	J3
2439	J8
2440	J5
2441	J11
2442	J10
2443	G7
2444	B13
2445	I4
2448	J12
2449	J12
2452	J13
2453	J13
2454	J13
2455	J12
2456	F2
3400	H7
3401	H7
3402	I8
3403	A11
3405	A11
3406	F1
3407	E13
3408	B11
3409	B11
3410	G3
3411	B11
3412	G1
3413	B11
3414	G2
3415	G1
3416	C11
3417	F13
3419	E13
3420	C5
3421	C5
3422	C6
3423	C6
3424	C6
3425	C6
3426	C7
3427	C7
3428	C7
3429	C8
3430	C8
3431	C8
3433	F13
3434	C4
3435	C5
3436	C5
3437	C5
3438	C6
3439	C6
3440	C6
3441	C7
3442	C7
3443	C7
3444	C7
3445	C8
3446	C8
3447	C8
3448	C13
3449	C13
3451	D13
3452	D13
3453	D4
3454	D10
3455	D4
3456	D9
3457	D13
3458	D4
3459	D9
3460	D4
3462	D10
3463	D4
3464	D9
3465	E4
3467	E10
3469	E4
3471	D2
3472	E4
3474	E10
3475	E13
3476	E4
3477	E9
3478	E4
3479	E9
3480	E10
3481	E4
3482	E9
3483	D2
3484	F4
3485	E9
3486	F4
3488	F10
3489	F4
3490	F9
3493	F10
3494	F4
3495	F4
3496	F4
3497	F5
3498	F5
3499	F6
3500	F6
3501	F7
3502	F8
3503	F8
3504	F8
3505	F10
3506	G5
3507	G5
3508	G5
3509	G6
3510	G7
3511	G7
3512	G8
3513	G8
3515	G9
3516	G10
3518	B3
3519	B3
3520	G6
3521	G7
3522	G10
3523	B3
3524	G12
3525	G12
3526	G10
3527	H12
3529	H10
3533	H3
3534	H3
3535	H4
3536	H11
3537	H11
3538	I9
3539	I8
3541	I2
3543	I2
3544	I8
3545	I2
3546	I8
3547	I2
3548	J2
3549	J12
3553	I10
3554	I11
3555	F9
3556	F9
3557	B13
3558	A12
3559	G8
4400	H12
4401	H1
4402	G2
4403	I12
4404	B14
5400	F6
5401	F7
5402	E3
5403	I9
6400	A11
6401	A11
6402	E13
6403	B11
6404	B11
6405	B11
6406	B11
6407	B5
6408	B6
6409	C11
6410	F13
6411	F13
6412	F13
6413	C13
6414	C13
6415	D13
6416	D13
6417	D10
6418	D13
6419	D12
6420	D10
6421	D12
6422	E10
6423	E2
6424	E12
6425	E10
6426	D2
6427	E12
6428	E10
6429	E13
6430	F12
6431	F10
6432	F10
6433	F10
6434	G10
6435	B4
6436	B4
6437	G10
6438	B4
6439	G10
6440	H10
6441	H11
6442	H10
7400	H4
7401	F4
7402	G1
7404	E14
7405	C14
7406	B12
7408	F9
7409	G4
9479	F9

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	4822 135 00171	FTD Display
1401	4822 267 10756	Flex Connector 13 pin
1406	4822 276 13114	Tact Switch
1407	4822 276 13114	Tact Switch
1410	4822 276 13114	Tact Switch
1411	4822 276 13114	Tact Switch
1412	4822 276 13114	Tact Switch
1413	4822 276 13114	Tact Switch
1414	4822 276 13114	Tact Switch
1415	4822 276 13114	Tact Switch
1416	4822 276 13114	Tact Switch
1417	4822 276 13114	Tact Switch
1420	4822 276 13114	Tact Switch
1421	4822 276 13114	Tact Switch
1423	4822 276 13114	Tact Switch
1426	4822 276 13114	Tact Switch
1427	4822 276 13114	Tact Switch
1428	4822 276 13114	Tact Switch
1429	4822 276 13114	Tact Switch
1436	4822 101 21261	Rot Encoder 24P

CAPACITORS

2408	5322 122 32659	33pF 5% 50V
2409	5322 122 32659	33pF 5% 50V
2412	4822 126 10002	100nF 20% 25V
2414	4822 126 10002	100nF 20% 25V
2415	4822 126 10002	100nF 20% 25V
2416	4822 124 42446	100µF 20% 10V
2418	4822 124 22651	1,0µF 20% 50V
2419	4822 124 42446	100µF 20% 10V
2420	4822 124 22651	1,0µF 20% 50V
2421	4822 124 22652	2,2µF 20% 50V
2422	4822 126 10002	100nF 20% 25V
2423	4822 126 13486	15pF 2% 63V
2424	4822 126 13486	15pF 2% 63V
2425	4822 126 10002	100nF 20% 25V
2426	4822 126 13751	47nF10% 63V
2427	4822 122 33175	2,2nF 20% 50V
2428	4822 122 33177	10nF 20% 50V
2434	4822 126 13692	47pF 1% 63V
2435	4822 126 13692	47pF 1% 63V
2436	4822 126 13692	47pF 1% 63V
2437	4822 126 13692	47pF 1% 63V
2441	4822 122 33177	10nF 20% 50V
2442	4822 122 33177	10nF 20% 50V
2443	4822 122 33177	10nF 20% 50V
2444	4822 122 33177	10nF 20% 50V
2456	5322 122 34123	1nF 10% 50V

RESISTORS

3403	4822 117 11503	220R 1% 0.1W
3405	4822 117 11503	220R 1% 0.1W
3406	4822 117 11139	1k5 1% 0,1W
3407	4822 051 20561	560R 5% 0,1W
3408	4822 117 11503	220R 1% 0.1W
3409	4822 117 11503	220R 1% 0.1W
3410	4822 051 20392	3k9 5% 0,1W
3411	4822 117 11503	220R 1% 0.1W
3412	4822 051 20392	3k9 5% 0,1W
3413	4822 117 11503	220R 1% 0.1W
3416	4822 117 11503	220R 1% 0.1W
3417	4822 051 20561	560R 5% 0,1W
3419	4822 051 20561	560R 5% 0,1W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3423	4822 051 10102	1k 2% 0,25W
3424	4822 051 10102	1k 2% 0,25W
3425	4822 051 10102	1k 2% 0,25W
3426	4822 051 10102	1k 2% 0,25W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 10102	1k 2% 0,25W
3430	4822 051 10102	1k 2% 0,25W
3431	4822 051 10102	1k 2% 0,25W
3433	4822 051 20561	560R 5% 0,1W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 20561	560R 5% 0,1W
3449	4822 051 20561	560R 5% 0,1W
3451	4822 051 20561	560R 5% 0,1W
3452	4822 051 20561	560R 5% 0,1W
3453	4822 116 83884	47k 5% 0,5W
3454	4822 051 20331	330R 5% 0,1W
3455	4822 116 83884	47k 5% 0,5W
3456	4822 117 10833	10k 1% 0,1W
3457	4822 051 20561	560R 5% 0,1W
3458	4822 116 83884	47k 5% 0,5W
3459	4822 117 10833	10k 1% 0,1W
3460	4822 116 83884	47k 5% 0,5W

ELECTRICAL PARTS LIST - FRONT BOARD

3462	4822 051 20331	330R 5% 0,1W
3463	4822 116 52271	33k 5% 0,5W
3464	4822 117 10833	10k 1% 0,1W
3465	4822 116 83864	10k 5% 0,5W
3467	4822 051 20331	330R 5% 0,1W
3469	4822 051 10102	1k 2% 0,25W
3471	4822 050 24708	4R7 1% 0,6W
3472	4822 051 10102	1k 2% 0,25W
3474	4822 051 20331	330R 5% 0,1W
3475	4822 051 20561	560R 5% 0,1W
3476	4822 051 20101	100R 5% 0,1W
3477	4822 051 20101	100R 5% 0,1W
3478	4822 051 10102	1k 2% 0,25W
3479	4822 051 20101	100R 5% 0,1W
3480	4822 051 20331	330R 5% 0,1W
3481	4822 051 10102	1k 2% 0,25W
3482	4822 051 20101	100R 5% 0,1W
3483	4822 050 24708	4R7 1% 0,6W
3484	4822 051 10102	1k 2% 0,25W
3485	4822 051 20101	100R 5% 0,1W
3486	4822 051 10102	1k 2% 0,25W
3488	4822 051 20331	330R 5% 0,1W
3489	4822 051 10102	1k 2% 0,25W
3490	4822 051 10102	1k 2% 0,25W
3493	4822 051 20331	330R 5% 0,1W
3494	4822 051 20331	330R 5% 0,1W
3495	4822 117 10833	10k 1% 0,1W
3496	4822 051 10102	1k 2% 0,25W
3497	4822 050 11002	1k 1% 0,4W
3498	4822 051 10102	1k 2% 0,25W
3499	4822 051 10102	1k 2% 0,25W
3500	4822 051 10102	1k 2% 0,25W
3501	4822 051 10102	1k 2% 0,25W
3502	4822 051 10102	1k 2% 0,25W
3503	4822 051 10102	1k 2% 0,25W
3504	4822 051 10102	1k 2% 0,25W
3505	4822 051 20331	330R 5% 0,1W
3506	4822 050 11002	1k 1% 0,4W
3507	4822 051 10102	1k 2% 0,25W
3508	4822 051 10102	1k 2% 0,25W
3509	4822 117 11449	2k2 1% 0,1W
3510	4822 051 10102	1k 2% 0,25W
3511	4822 051 10102	1k 2% 0,25W
3512	4822 051 10102	1k 2% 0,25W
3513	4822 117 11449	2k2 1% 0,1W
3515	4822 051 20104	100k 5% 0,1W
3516	4822 051 20331	330R 5% 0,1W
3518	4822 051 20331	330R 5% 0,1W
3519	4822 051 20331	330R 5% 0,1W
3520	4822 117 10833	10k 1% 0,1W
3521	4822 051 10102	1k 2% 0,25W
3522	4822 051 20331	330R 5% 0,1W
3523	4822 051 20331	330R 5% 0,1W
3524	4822 051 10102	1k 2% 0,25W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 20331	330R 5% 0,1W
3527	4822 051 10102	1k 2% 0,25W
3529	4822 051 20331	330R 5% 0,1W
3533	4822 117 10833	10k 1% 0,1W
3534	4822 117 10833	10k 1% 0,1W
3535	4822 117 10833	10k 1% 0,1W
3536	4822 051 20474	470k 5% 0,1W
3537	4822 051 20474	470k 5% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3543	4822 051 10102	1k 2% 0,25W
3545	4822 051 10102	1k 2% 0,25W
3546	4822 117 10833	10k 1% 0,1W
3547	4822 051 10102	1k 2% 0,25W
3548	4822 051 10102	1k 2% 0,25W
3549	4822 116 83864	10k 5% 0,5W
3553	4822 117 10833	10k 1% 0,1W
3554	4822 117 10833	10k 1% 0,1W
3555	4822 117 10833	10k 1% 0,1W
3556	4822 051 20561	560R 5% 0,1W
3557	4822 051 20331	330R 5% 0,1W
3558	4822 117 10833	10k 1% 0,1W
3559	4822 051 20105	1M 5% 0,1W
4400	4822 051 20008	0R Jumper 0805
4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4405	4822 051 20008	0R Jumper 0805
4406	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4415	4822 051 20008	0R Jumper 0805
4417	4822 051 20008	0R Jumper 0805
4418	4822 051 20008	0R Jumper 0805
4419	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

4431	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4444	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	4822 242 72066	Ceram Resonator 8MHz
5401	4822 242 70938	X'tal Resonator 32,768kHz
5402	4822 157 11477	Coil 2,2µH 5%

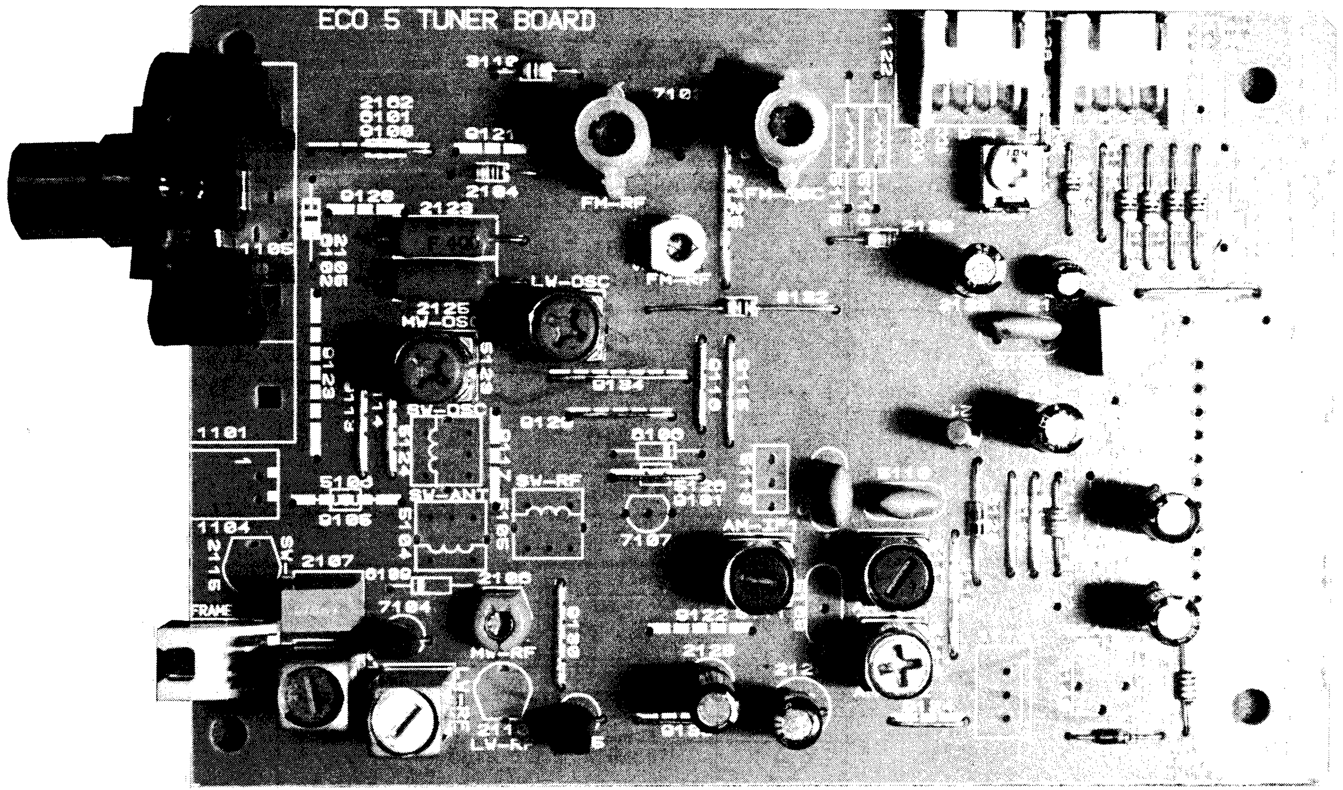
DIODES

6400	4822 130 10791	LTL-1CHGE
6401	4822 130 10791	LTL-1CHGE
6402	4822 130 10791	LTL-1CHGE
6403	4822 130 10791	LTL-1CHGE
6404	4822 130 10791	LTL-1CHGE
6405	4822 130 10791	LTL-1CHGE
6406	4822 130 10791	LTL-1CHGE
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 10791	LTL-1CHGE
6410	4822 130 10792	LTL-1CHPE
6411	4822 130 10792	LTL-1CHPE
6412	4822 130 10792	LTL-1CHPE
6413	4822 130 10792	LTL-1CHPE
6414	4822 130 10792	LTL-1CHPE
6415	4822 130 10791	LTL-1CHGE
6416	4822 130 10792	LTL-1CHPE
6417	4822 130 30621	1N4148
6418	4822 130 10792	LTL-1CHPE
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 31878	1N4003G
6424	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6426	4822 130 31878	1N4003G
6428	4822 130 30621	1N4148
6429	4822 130 10792	LTL-1CHPE
6431	4822 130 30621	1N4148
6432	4822 130 30621	1N4148
6433	4822 130 30621	1N4148
6434	4822 130 30621	1N4148
6435	4822 130 30621	1N4148
6436	4822 130 30621	1N4148
6437	4822 130 30621	1N4148
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7401	4822 209 16428	TMP87CP71F - '316S51731'
7402	4822 209 31508	ST24C01B1
7404	4822 209 15449	74HC4094D
7405	4822 209 15449	74HC4094D
7406	4822 209 15449	74HC4094D
7408	4822 130 60511	BC847B
7409	4822 130 10165	GP1U28XP

Note : Only the parts mentioned in this list are normal service parts.

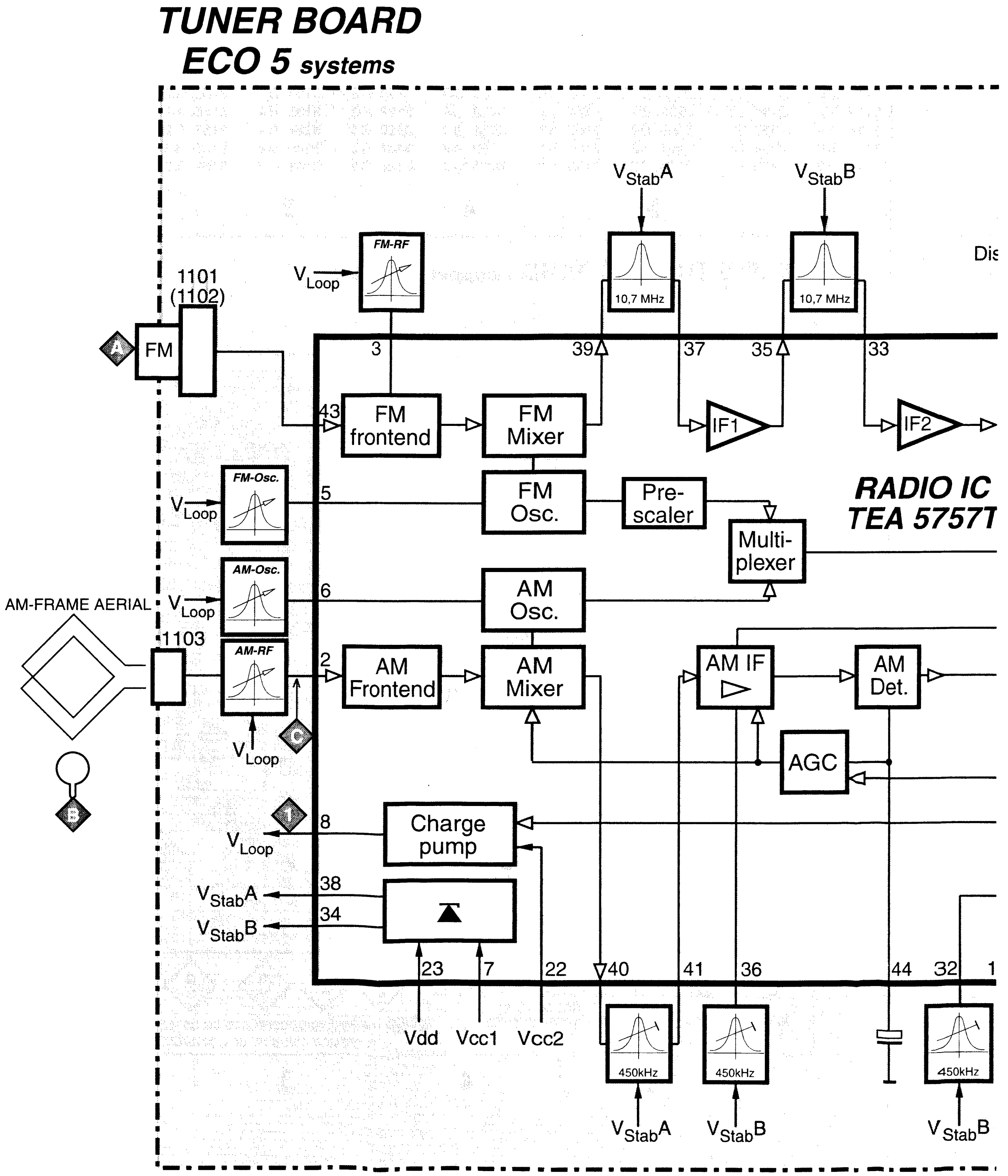

ECO 5 TUNER BOARD

TUNER BOARD ECO5

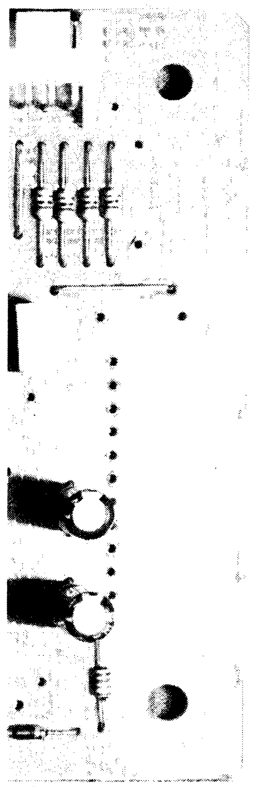
TABLE OF CONTENTS

Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout 7B-2
Circuit diagram 7B-3
Partslist 7B-4

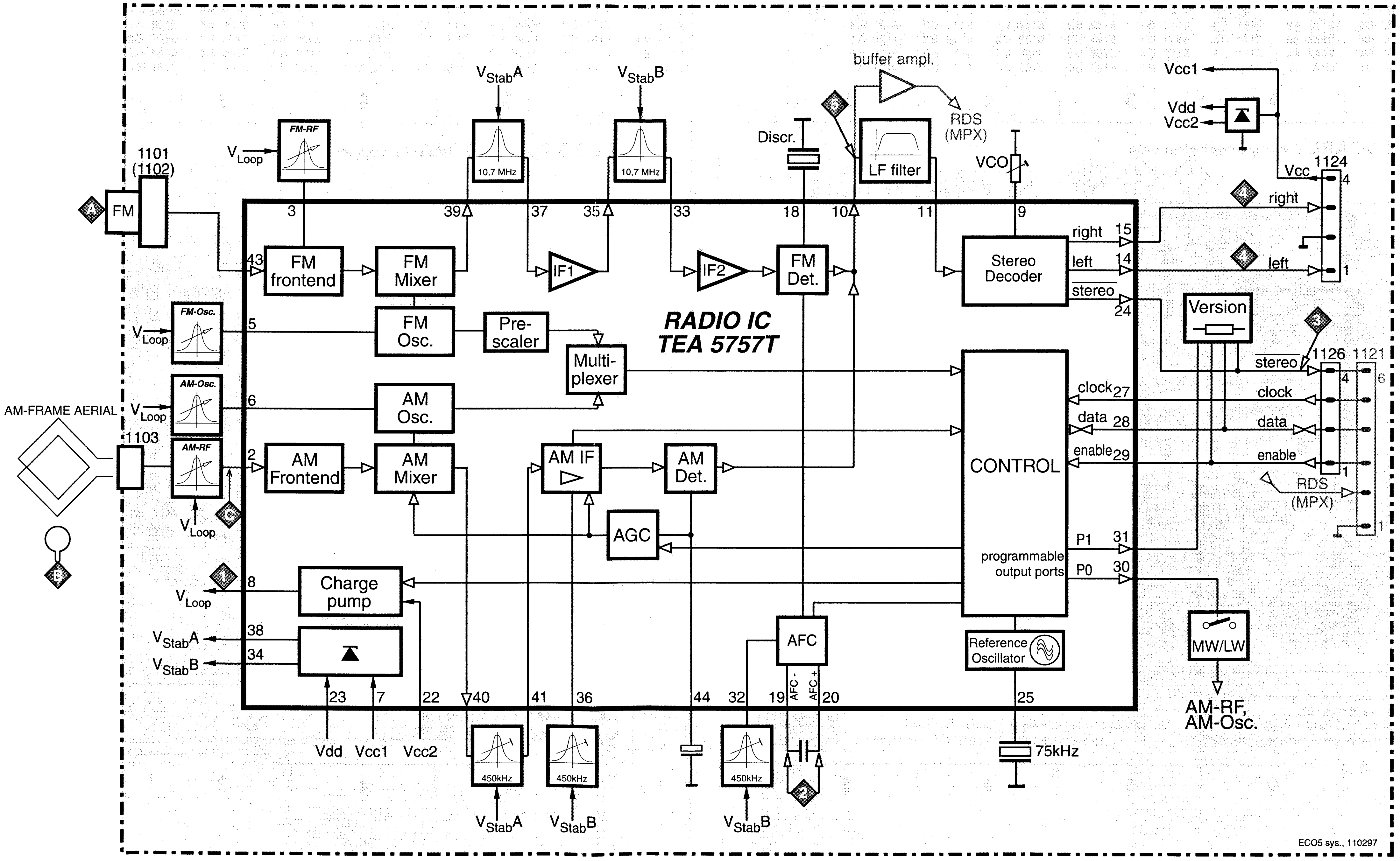
BLOCKDIAGRAM


TUNER BOARD
ECO 5 systems
VStabA
VStabB
Dis
10,7 MHz
10,7 MHz
FM-RF
VLoop
1101
(1102)
A
FM
3
39
37
35
33
43
FM frontend
FM Mixer
IF1
IF2
FM-Osc.
VLoop
5
FM Osc.
Pre-scaler
Multi-plexer
RADIO IC
TEA 5757T
AM-Osc.
AM-FRAME AERIAL
VLoop
6
AM Osc.
1103
AM-RF
2
AM Frontend
AM Mixer
AM IF
AM Det.
C
VLoop
AGC
B
1
8
VLoop
Charge pump
VStabA
38
VStabB
34
23
7
22
40
41
36
44
32
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kHz
VStabA
VStabB
VStabB

BLOCKDIAGRAM

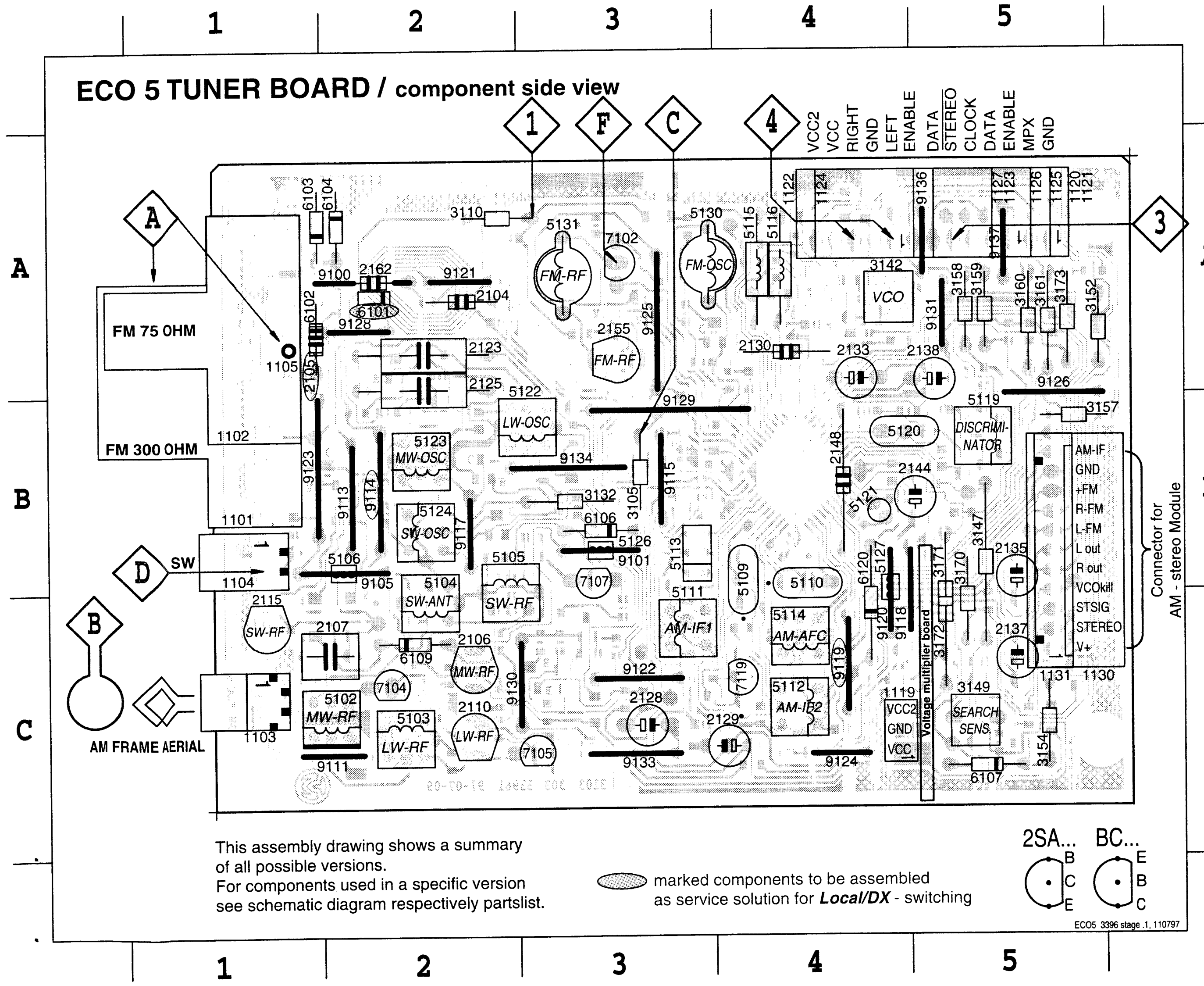


TUNER BOARD
ECO 5 systems



RADIO IC
TEA 5757T
FM
1101
(1102)
A
VLoop
FM-RF
FM frontend
FM Mixer
FM Osc.
FM-Osc.
Pre-scaler
Multi-plexer
AM Osc.
AM-Osc.
AM Frontend
AM Mixer
AM-RF
AM-FRAME AERIAL
1103
C
E
VStabA
VStabB
10,7 MHz
IF1
IF2
FM Det.
Discr.
buffer ampl.
RDS (MPX)
LF filter
VCO
Stereo Decoder
right
left
stereo
Version
CONTROL
clock
data
enable
P1
P0
programmable output ports
AM IF
AM Det.
AGC
AFC
AFC -
AFC +
Charge pump
Reference Oscillator
75kHz
450kHz
Vdd
Vcc1
Vcc2
Vcc
1124
1126
1121
MW/LW
AM-RF, AM-Osc.
1
2
3
4
5
3 39 37 35 33 18 10 11 9 15 14 24 27 28 29 31 30 25 43 5 6 2 8 38 34 23 7 22 40 41 36 44 32 19 20
ECO5 sys., 110297

1101	A1	2106	C2	2137	C5	3149	C5	3173	A5	5114	C4	5130	A3	7104	C2	9117	B2	9129	B3
1102	A1	2107	C2	2138	A5	3152	A5	5102	C2	5115	A4	5131	A3	7105	C3	9118	B4	9130	C3
1103	C1	2110	C2	2144	B5	3154	C5	5103	C2	5116	A4	6101	A2	7107	B3	9119	C4	9131	A5
1104	B1	2115	C1	2148	B4	3157	B5	5104	C2	5119	B5	6102	A1	7119	C4	9120	B4	9133	C3
1105	A1	2123	A2	2155	A3	3158	A5	5105	B2	5120	B4	6103	A1	9100	A2	9121	A2	9134	B3
1119	C5	2125	A2	2162	A2	3159	A5	5106	B2	5121	B4	6104	A2	9101	B3	9122	C3	9136	A5
1120	A5	2128	C3	3105	B3	3160	A5	5109	B4	5122	B3	6106	B3	9105	B2	9123	B1	9137	A5
1130	B5	2129	C4	3110	A2	3161	A5	5110	B4	5123	B2	6107	C5	9111	C2	9124	C4		
1131	B5	2130	A4	3132	B3	3170	C5	5111	C3	5124	B2	6109	C2	9113	B2	9125	A3		
2104	A2	2133	A4	3142	A4	3171	C5	5112	C4	5126	B3	6120	C4	9114	B2	9126	B5		
2105	A1	2135	B5	3147	B5	3172	C5	5113	B3	5127	B4	7102	A3	9115	B3	9128	A2		

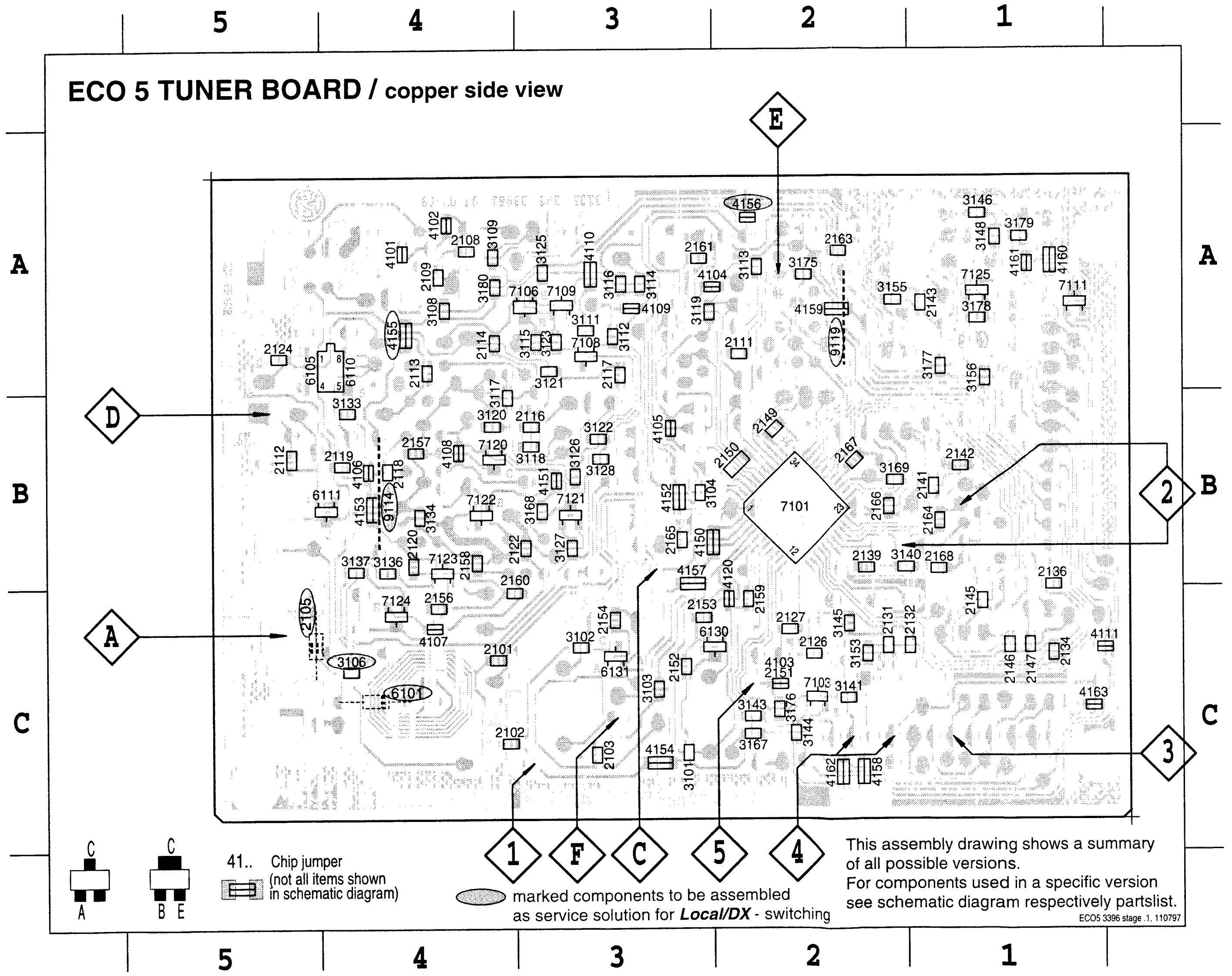

1
2
3
4
5
A
B
C
A
F
C
4
1
D
B
3
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
FM-RF
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
SW-RF
MW-RF
MW-RF
LW-RF
LW-RF
DISCRIMI-NATOR
AM-IF1
AM-AFC
AM-IF2
SEARCH SENS.
Voltage multiplier board
VCC2
GND
VCC
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
B
C
E
E
B
C
ECO5 3396 stage 1, 110797

ECO 5 TUNER BOARD / component side view

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for ***Local/DX*** - switching

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4106	B4	4154	C3	6110	A4	7121	B3
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4107	C4	4155	A4	6111	B4	7122	B4
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4108	B4	4156	A2	6130	C2	7123	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4109	A3	4157	B3	6131	C3	7124	C4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4110	A3	4158	C2	7101	B2	7125	A1
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4111	C1	4159	A2	7103	C2		
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	4101	A4	4120	C2	4160	A1	7106	A3		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4102	A4	4150	B2	4161	A1	7108	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4103	C2	4151	B3	4162	C1	7109	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4104	A2	4152	B3	4163	C1	7111	A1		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4105	B3	4153	B4	6105	A4	7120	B4		


5
4
3
2
1
A
B
C
E
D
A
2
3
1
F
C
5
4
7101
C
C
A
B E
ECO5 3396 stage 1, 110797

ECO 5 TUNER BOARD / copper side view

41.. Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUST

Waverange
VARICAP ALIGNME
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)
MW FM/AM-version, 10kHz grid 530 - 1700kHz
FM/MW-version, 9kHz grid 531 - 1602kHz
LW 153 - 279kHz
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz
FM IF
FM
FM RF
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)
VCO
FM
AM IF
MW
AM AFC **MW**
AM RF 3)
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz
LW
MW FM/AM-version, 10kHz grid 530 - 1700kHz

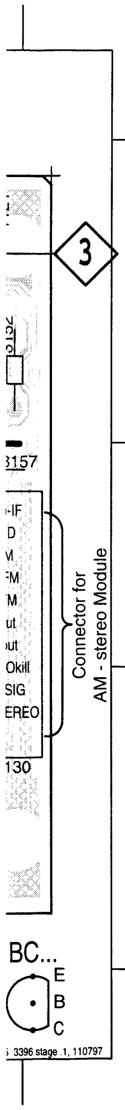
Use service test program. B

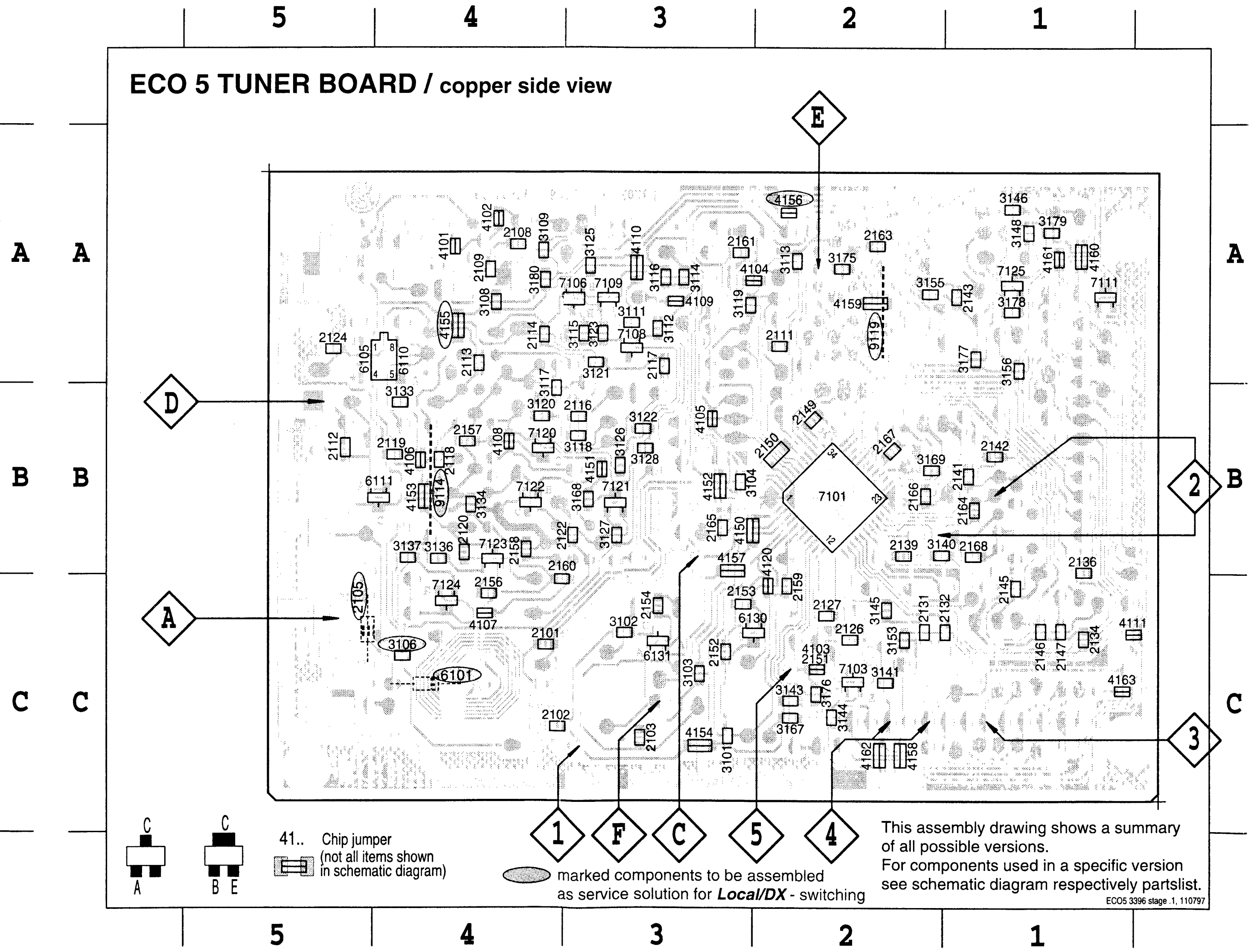
1) If sensitivity of frequency
(input signal: stereo left 9

3) For AM RF adjustments t

↕ Repeat

2101	C4
2102	C4
2103	C3
2108	A4
2109	A4
2111	A2
2112	B5
2113	A4
2114	A4
2116	B3
2117	A3
2118	B4
2119	B4
2120	B4
2122	B3
2124	A5
2126	C2
2127	C2
2131	C2
2132	C1
2134	C1
2136	B1
2139	B2
2141	B1
2142	B1
2143	A1
2145	C1
2146	C1
2147	C1
2149	B2
2150	B2
2151	C2
2152	C3
2153	C3
2154	C3
2156	C4
2157	B4
2158	B4
2159	C2
2160	C4
2161	A3
2163	A2
2164	B1
2165	B3
2166	B2
2167	B2
2168	B1
3101	C3
3102	C3
3103	C3
3104	B3
3106	C4
3108	A4
3109	A4
3111	A3
3112	A3
3113	A2
3114	A3
3115	A3
3116	A3
3117	B4
3118	B3
3119	A3
3120	B4
3121	A3
3122	B3
3123	A3
3125	A3
3126	B3
3127	B3
3128	B3
3133	B4
3134	B4
3136	B4
3137	B4
3140	B2
3141	C2
3143	C2
3144	C2
3145	C2
3146	A1
3148	A1
3153	C2
3155	A2
3156	A1
3167	C2
3168	B3
3169	B2
3175	A2
3176	C2
3177	A1
3178	A1
3179	A1
3180	A4
4101	A4
4102	A4
4103	C2
4104	A2
4105	B3
4106	B4
4107	C4
4108	B4
4109	A3
4110	A3
4111	C1
4120	C2
4150	B2
4151	B3
4152	B3
4153	B4
4154	C3
4155	A4
4156	A2
4157	B3
4158	C2
4159	A2
4160	A1
4161	A1
4162	C1
4163	C1
6105	A4
6110	A4
6111	B4
6130	C2
6131	C3
7101	B2
7103	C2
7106	A3
7108	A3
7109	A3
7111	A1
7120	B4
7121	B3
7122	B4
7123	B4
7124	C4
7125	A1





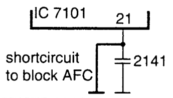
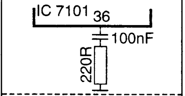
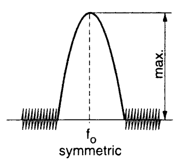
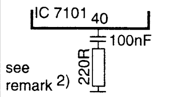
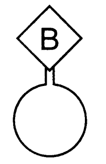
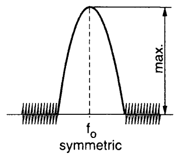
ECO 5 TUNER BOARD / copper side view

41.. Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F		5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A mod=1kHz Δf=±22.5kHz	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV		5111	4	
			 see remark [2]	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	 Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	4	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, discr. coil, 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

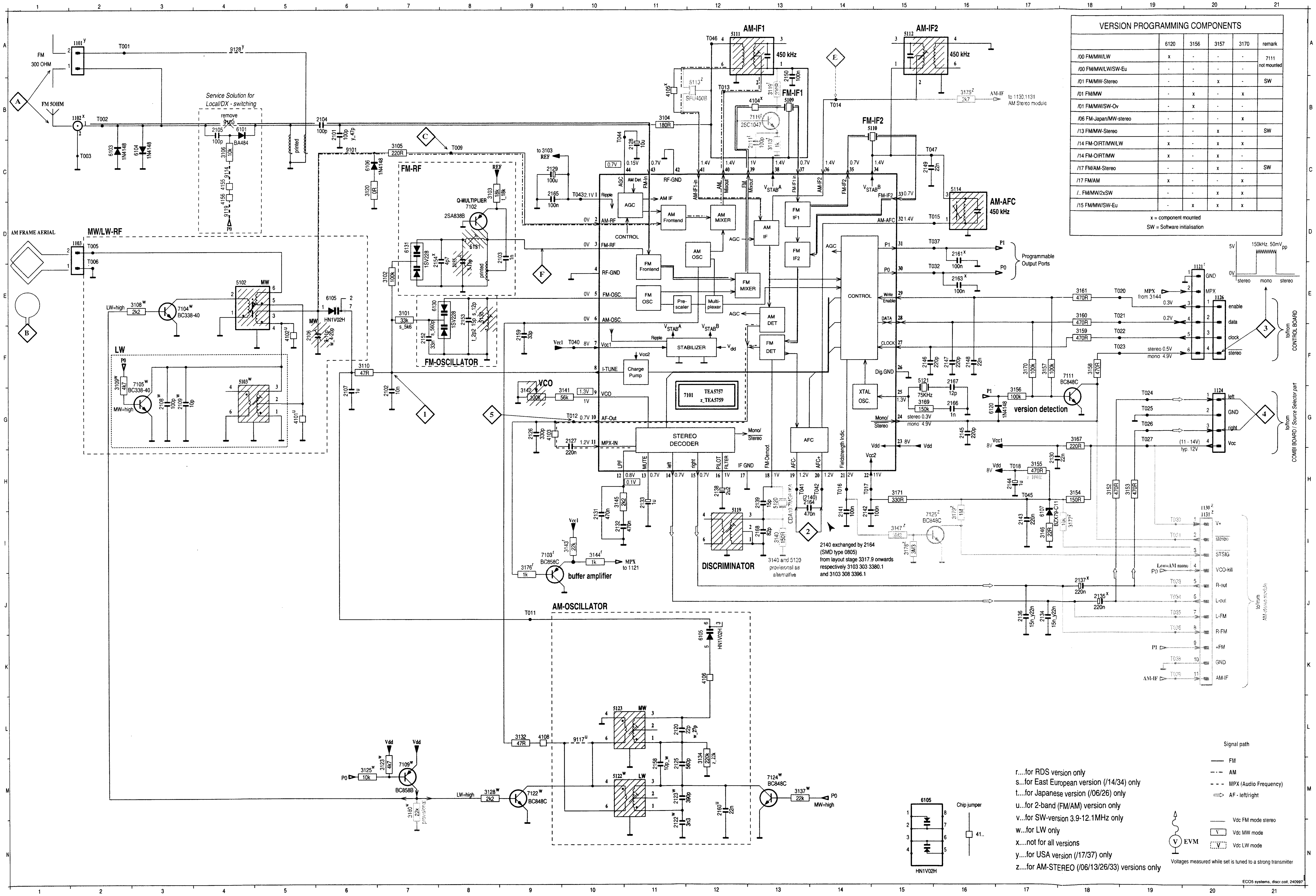
[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50HM
AM FRAME AERIAL
MW/LW-RF
MW
LW
Service Solution for Local/DX - switching
remove 3120
FM-RF
Q-MULTIPLIER 7102
FM-OSCILLATOR
VCO
AM-IF1
450 kHz
AM-IF2
450 kHz
FM-IF1
FM-IF2
AM-AFC
450 kHz
AGC
AM Frontend
AM MIXER
AM IF
AM OSC
FM Frontend
FM OSC
Pre-scaler
Multi-plexer
FM MIXER
FM IF1
FM IF2
AM DET
FM DET
STABILIZER
Charge Pump
CONTROL
XTAL OSC.
STEREO DECODER
AFC
TEA5757
7101
z_TEA5759
DISCRIMINATOR
buffer amplifier
AM-OSCILLATOR
version detection
Programmable Output Ports
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM stereo module
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 308 3396.1
3140 and 5120 provisional as alternative
150kHz. 50mVpp
5V
0V
stereo
mono
stereo
Chip jumper
HN1V02H
ECO5 systems, discr.coil, 240997

VERSION PROGRAMMING COMPONENTS	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path

- —— FM
- -·- AM
- - - - MPX (Audio Frequency)
- ⇨ AF - left/right

EVM

- .... Vdc FM mode stereo
- V Vdc MW mode
- V Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20224	220k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

3176	4822 051 10102	1k 2% 0,25W	for RDS version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

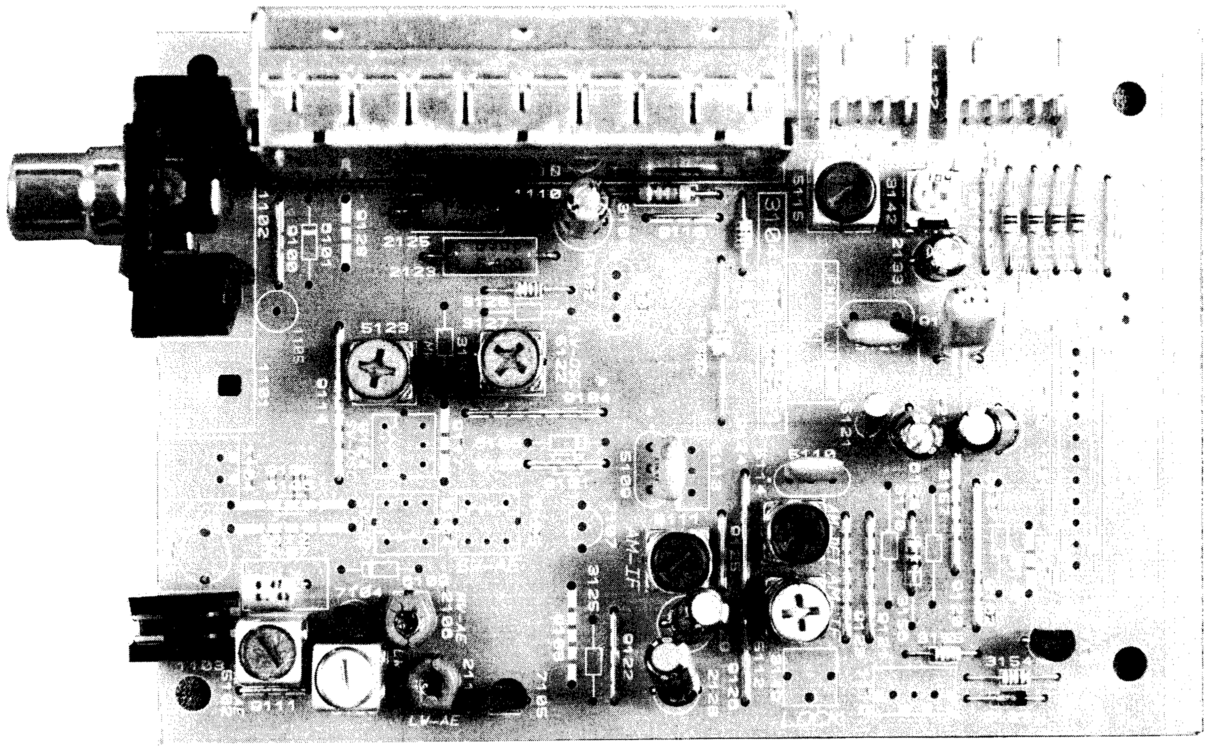
DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

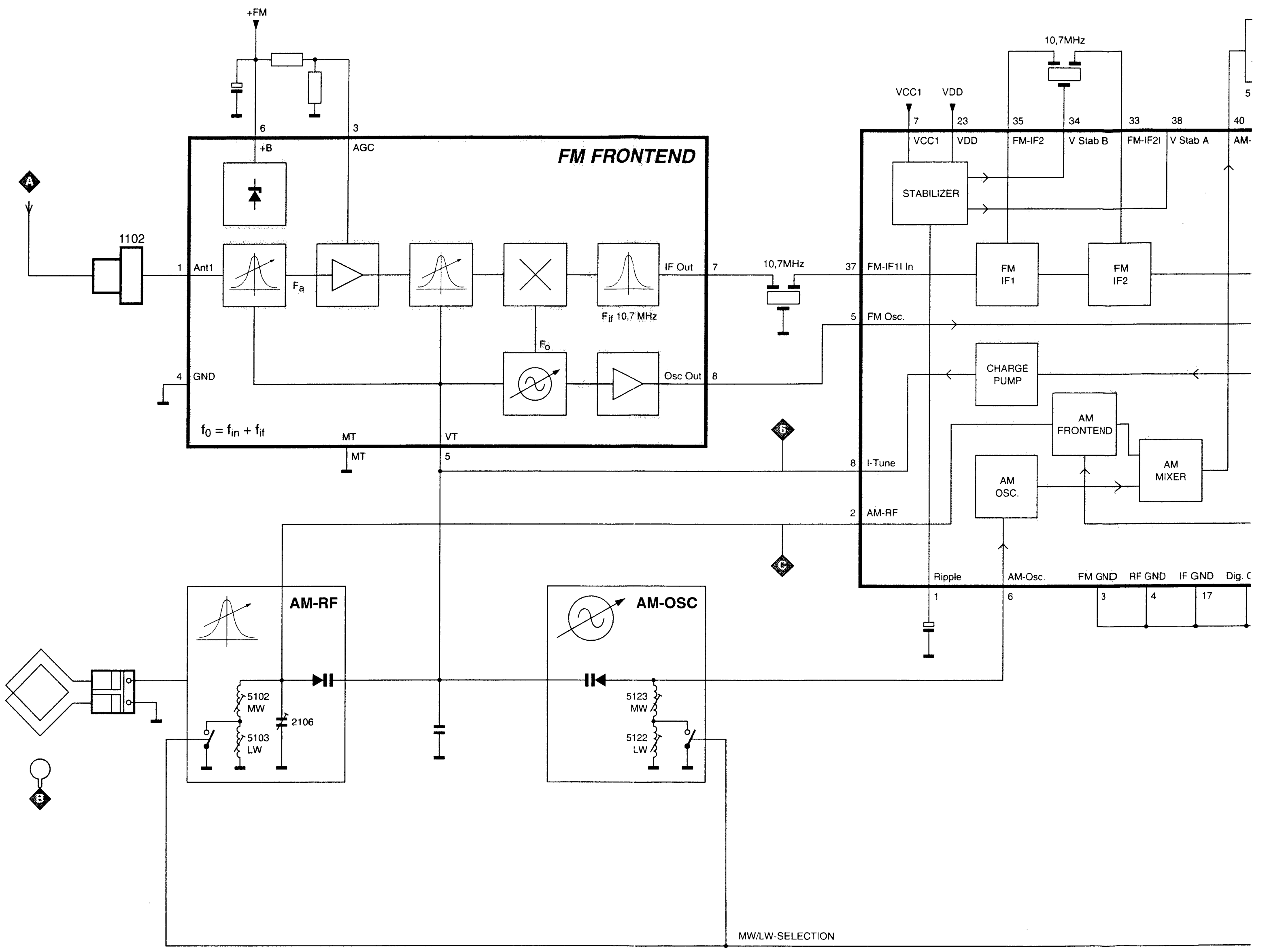


TUNER 95 BOARD

TABLE OF CONTENTS

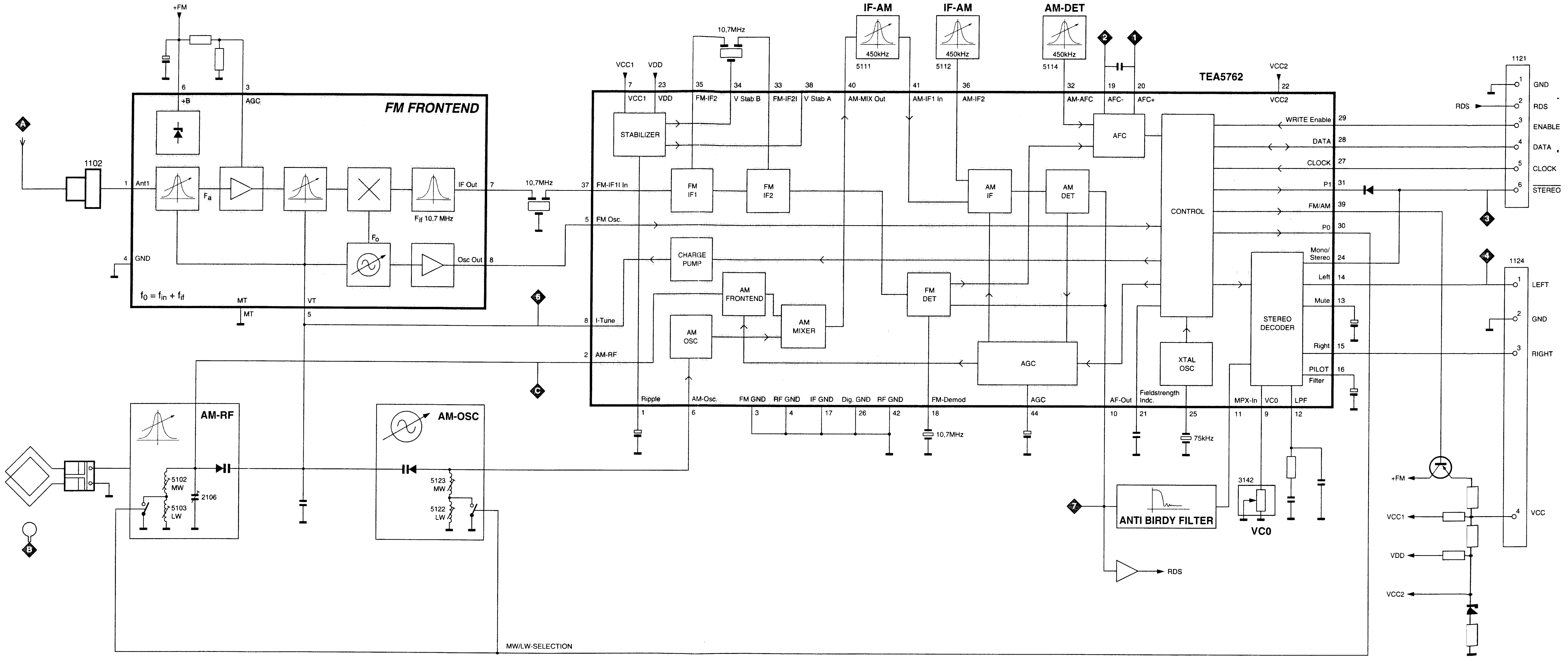
Blockdiagram 7D-1
Adjustmant table 7D-2
Component layout...7D-2
Circuit diagram..7D-3
Partslist 7D-4

BLOCKDIAGRAM

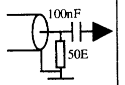


+FM
6
3
+B
AGC
FM FRONTEND
A
1102
1
Ant1
F_a
F_{if} 10,7 MHz
IF Out
7
F_o
4
GND
Osc Out
8
$f_0 = f_{in} + f_{if}$
MT
VT
MT
5
10,7MHz
10,7MHz
VCC1
VDD
7
23
35
34
33
38
40
5
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-
STABILIZER
37
FM-IF1I In
FM
IF1
FM
IF2
5
FM Osc.
CHARGE
PUMP
AM
FRONTEND
AM
MIXER
8
I-Tune
AM
OSC.
2
AM-RF
C
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. C
1
6
3
4
17
AM-RF
AM-OSC
5102
MW
2106
5103
LW
5123
MW
5122
LW
B
MW/LW-SELECTION

BLOCKDIAGRAM


+FM
6
+B
3
AGC
FM FRONTEND
A
1102
1
Ant1
Fa
IF Out
7
Fif 10,7 MHz
Fo
Osc Out
8
4
GND
f0 = fin + fif
MT
VT
5
10,7MHz
10,7MHz
IF-AM
450kHz
5111
IF-AM
450kHz
5112
AM-DET
450kHz
5114
2
1
TEA5762
VCC1
VDD
7
23
35
34
33
38
40
41
36
32
19
20
VCC2
22
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
STABILIZER
37
FM-IF1I In
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
5
FM Osc.
CHARGE PUMP
AM FRONTEND
AM MIXER
FM DET
6
8
I-Tune
2
AM-RF
AM OSC
AGC
XTAL OSC
STEREO DECODER
C
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VC0
LPF
1
6
3
4
17
26
42
18
44
10
21
25
11
9
12
10,7MHz
75kHz
WRITE Enable
29
DATA
28
CLOCK
27
P1
31
FM/AM
39
P0
30
Mono/ Stereo
24
Left
14
Mute
13
Right
15
PILOT Filter
16
1121
1
GND
RDS
2
RDS
3
ENABLE
4
DATA
5
CLOCK
6
STEREO
3
4
1124
1
LEFT
2
GND
3
RIGHT
+FM
VCC1
4
VCC
VDD
VCC2
7
ANTI BIRDY FILTER
3142
VC0
RDS
AM-RF
5102 MW
2106
5103 LW
B
AM-OSC
5123 MW
5122 LW
MW/LW-SELECTION

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	◇6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave *short pin 21 (IC7101) to ground*	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	 ◇C	MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave			5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

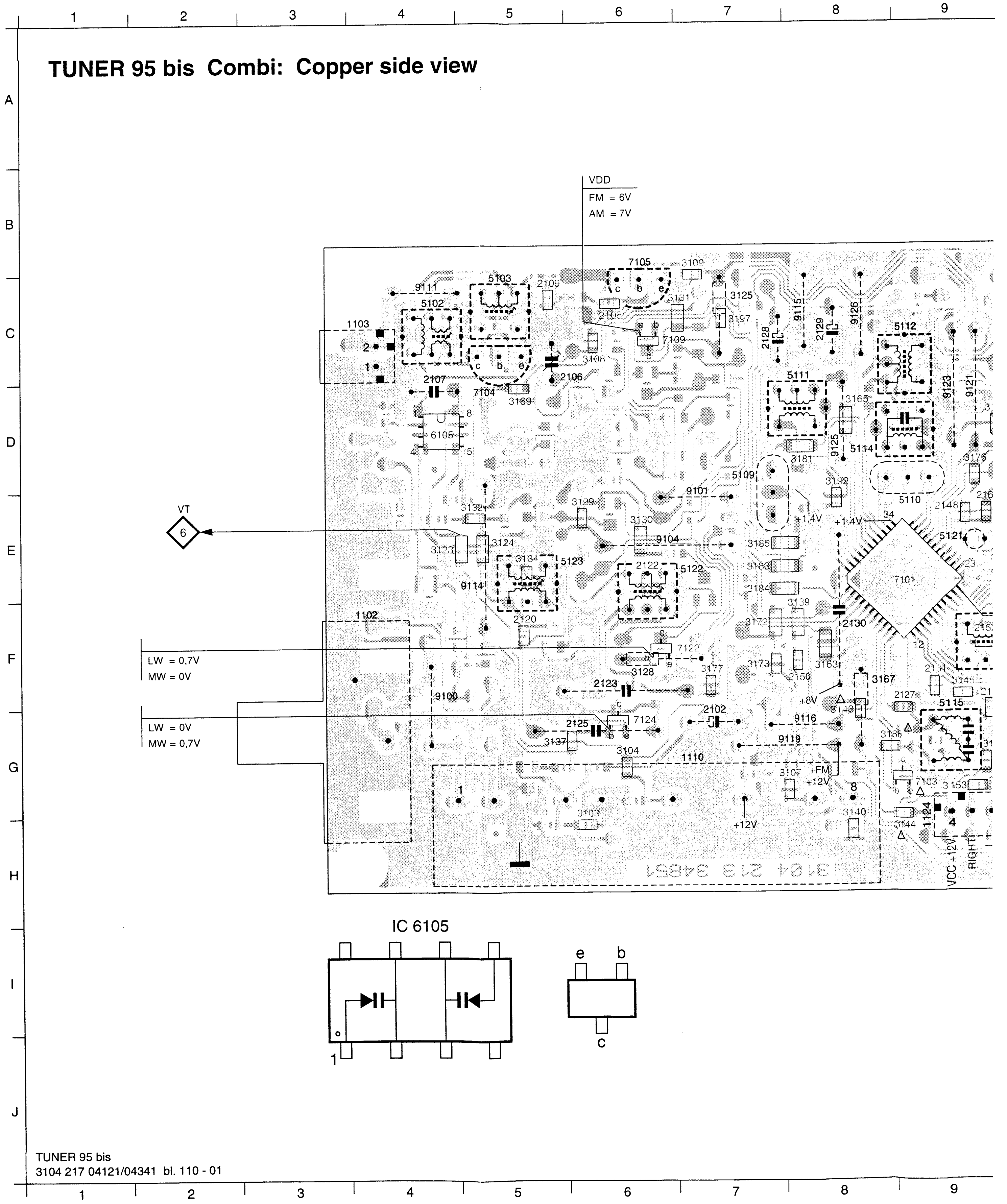
adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7	5103	C5
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7	5107	F10
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7	5109	D7
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E9
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C8
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C6	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8	5112	C9
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D8
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4	5115	G9

TUNER 95 bis Combi: Copper side view

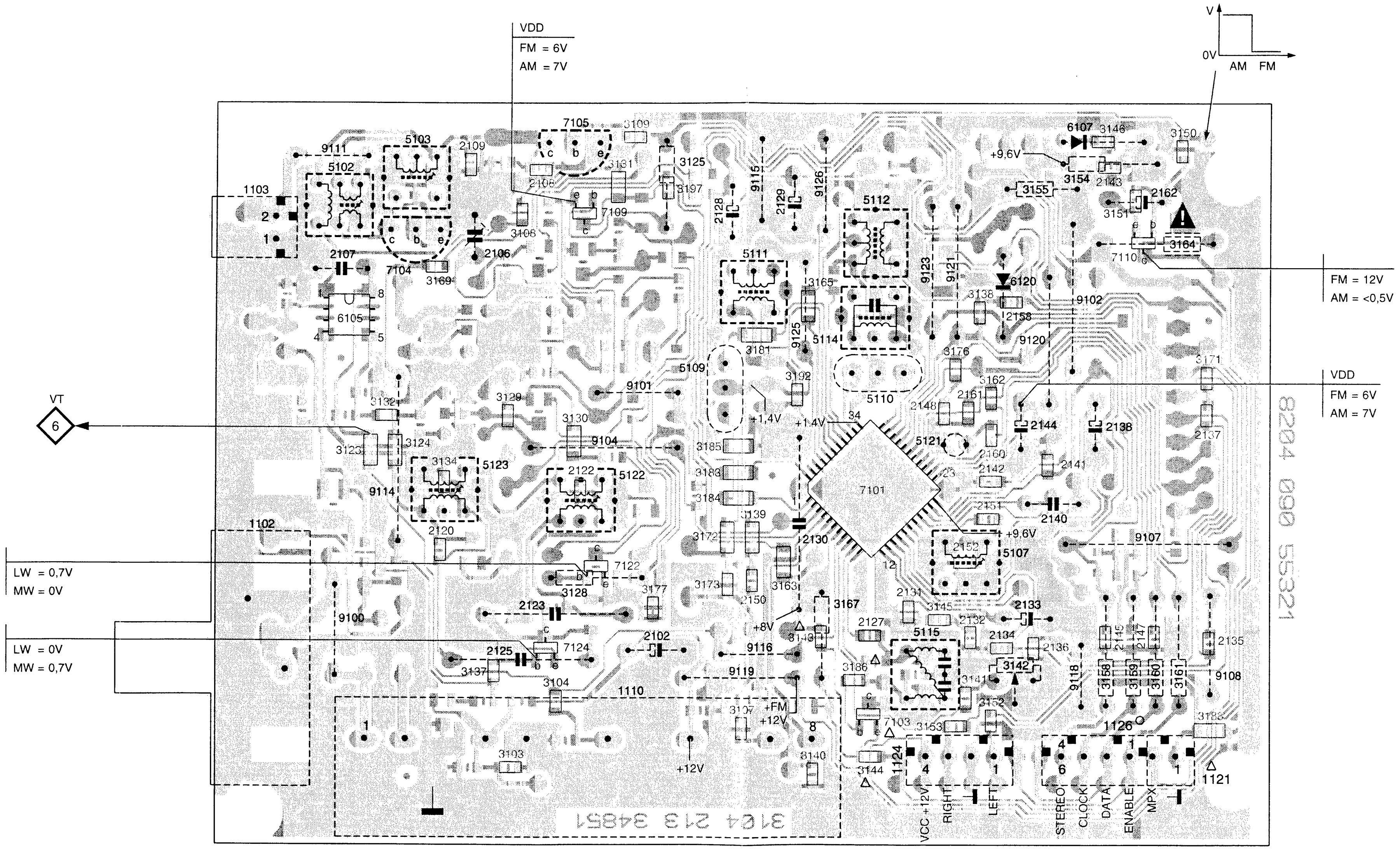

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
1110
1124
7101
7104
7105
7109
7122
7124
6105
5102
5103
5110
5111
5112
5114
5115
5121
5122
5123
9100
9101
9104
9111
9114
9116
9119
+1,4V
+8V
+12V
+FM
VCC +12V
RIGHT
3104 213 34851
IC 6105
e
b
c

TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

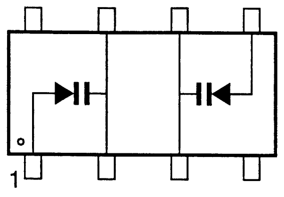
tmeter
/
V
2V
4V
2V
V
mV
kHz
on
m
l and
ght
mV
1/04341

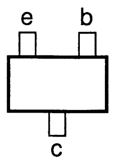
1102	F4
1103	C3
1110	G7
1121	H11
1124	H9
1126	G10
2102	G7
2106	C5
2107	C4
2108	C6
2109	C5
2120	F5
2122	E6
2123	F6
2125	G5
2127	F9
2128	C7
2129	C8
2130	F8
2131	F9
2132	F9
2133	F10
2134	G10
2135	G11
2136	G10
2137	E11
2138	E10
2140	F10
2141	E10
2142	E9
2143	C10
2144	E10
2145	G11
2147	G11
2148	E9
2150	F8
2151	F9
2152	F9
2158	D10
2160	E9
2161	E9
2162	C11
3103	H6
3104	G6
3107	G7
3108	C6
3109	B7
3123	E4
3124	E5
3125	C7
3128	F6
3129	E6
3130	E6
3131	C6
3132	E5
3134	E5
3137	G5
3138	D9
3139	F8
3140	H8
3141	G9
3142	G10
3143	G8
3144	H8
3145	F9
3146	B10
3150	C11
3151	C10
3152	G9
3153	G9
3154	C10
3155	C10
3158	G11
3159	G11
3160	G11
3161	G11
3162	D9
3163	F8
3164	C11
3165	D8
3167	F8
3169	D5
3171	D11
3172	F7
3173	F7
3176	D9
3177	F7
3181	D8
3183	E7
3184	E7
3185	E7
3186	G8
3188	G11
3192	D8
3197	C7
5102	C4
5103	C5
5107	F10
5109	D7
5110	E9
5111	C8
5112	C9
5114	D8
5115	G9
5121	E9
5122	E7
5123	E5
6105	D4
6107	B10
6120	D10
7101	E9
7103	G9
7104	D5
7105	B6
7109	C6
7110	D11
7122	F7
7124	G6
9100	F4
9101	E7
9102	D10
9104	E6
9107	F11
9108	G11
9111	C4
9114	E5
9115	C8
9116	G8
9118	G10
9119	G7
9120	D10
9121	D9
9123	D9
9125	D8
9126	C8

TUNER 95 bis Combi: Copper side view


VDD
FM = 6V
AM = 7V
V
0V
AM
FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
1110
1124
1126
1121
6105
7101
7104
7105
7109
7110
7122
7124
5102
5103
5107
5109
5110
5111
5112
5114
5115
5121
5122
5123
6107
6120
+9,6V
+1,4V
+8V
+12V
+FM
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
3104 213 34851
8204 090 55321

IC 6105



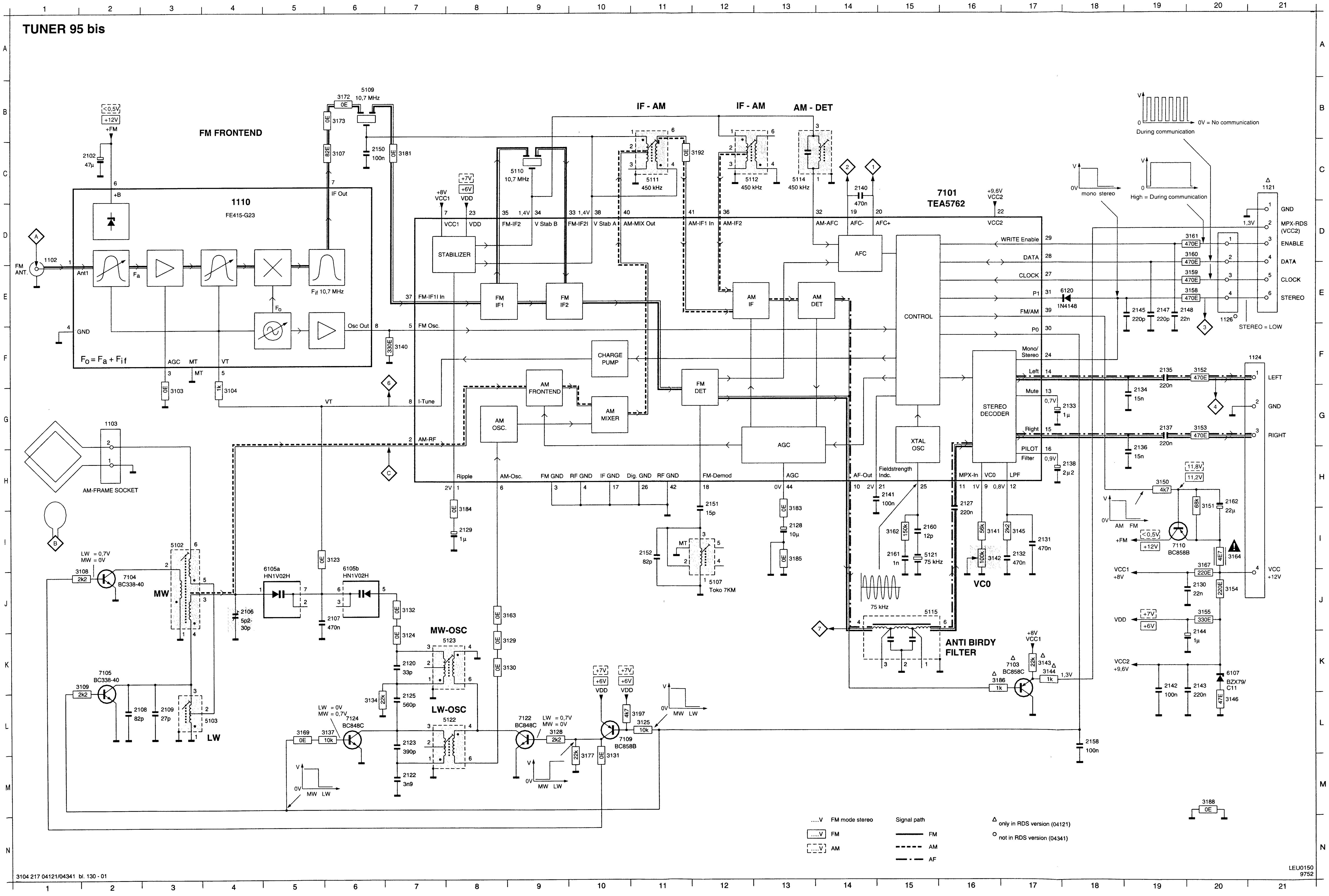


△ only in RDS version (04121)

○ not in RDS version (04341)

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis


FM FRONTEND
1110
FE415-G23
FM ANT.
1102
Ant1
GND
IF Out
Osc Out
AGC
MT
VT
$F_o = F_a + F_{if}$
F_{if} 10,7 MHz
5109
10,7 MHz
5110
10,7 MHz
IF - AM
IF - AM
AM - DET
5111
450 kHz
5112
450 kHz
5114
450 kHz
7101
TEA5762
VCC1
VDD
STABILIZER
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
FM-IF1I In
FM Osc.
I-Tune
AM-RF
FM IF1
FM IF2
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AM IF
AM DET
AFC
CONTROL
AGC
XTAL OSC
STEREO DECODER
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/Stereo
Left
Mute
Right
PILOT
Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
VCO
75 kHz
5115
ANTI BIRDY FILTER
1103
AM-FRAME SOCKET
MW
LW
MW-OSC
LW-OSC
5102
5103
5123
5122
7104 BC338-40
7105 BC338-40
7124 BC848C
7122 BC848C
7109 BC858B
7103 BC858C
7110 BC858B
6105a HN1V02H
6105b HN1V02H
6120 1N4148
6107 BZX79/C11
5107 Toko 7KM
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
MW LW
AM FM
0V = No communication
During communication
High = During communication
mono stereo
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
STEREO = LOW
1126
1124
LEFT
GND
RIGHT
VCC +12V
VCC1 +8V
VDD
VCC2 +9,6V
.....V FM mode stereo
FM
AM
Signal path
FM
AM
AF
Δ only in RDS version (04121)
○ not in RDS version (04341)
3104 217 04121/04341 bl. 130 - 01
LEU0150
9752

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 63V
2125	4822 121 10578	560P 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	50V 15pF 5%
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3123	4822 051 10008	0R 5% 0,25W
3124	4822 051 10008	0R 5% 0,25W
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R 5% 0,25W
3131	4822 051 10008	0R 5% 0,25W
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R 5% 0,25W
3140	4822 051 20331	330R 5% 0,1W
3141	4822 051 20563	56k 5% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 051 20224	220k 5% 0,1W
3163	4822 051 10008	0R 5% 0,25W
3164	4822 052 10478 △	4R7 5% 0,33W
3165	4822 051 10008	0R 5% 0,25W
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R 5% 0,25W
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3181	4822 051 10008	0R 5% 0,25W
3183	4822 051 10008	0R 5% 0,25W
3184	4822 051 10008	0R 5% 0,25W
3185	4822 051 10008	0R 5% 0,25W
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R 5% 0,25W
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW AERIAL
5103	4822 157 71635	LW AERIAL
5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz

5114	4822 157 70302	AM-IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHz
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6107	4822 130 34488	BZX79-B11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

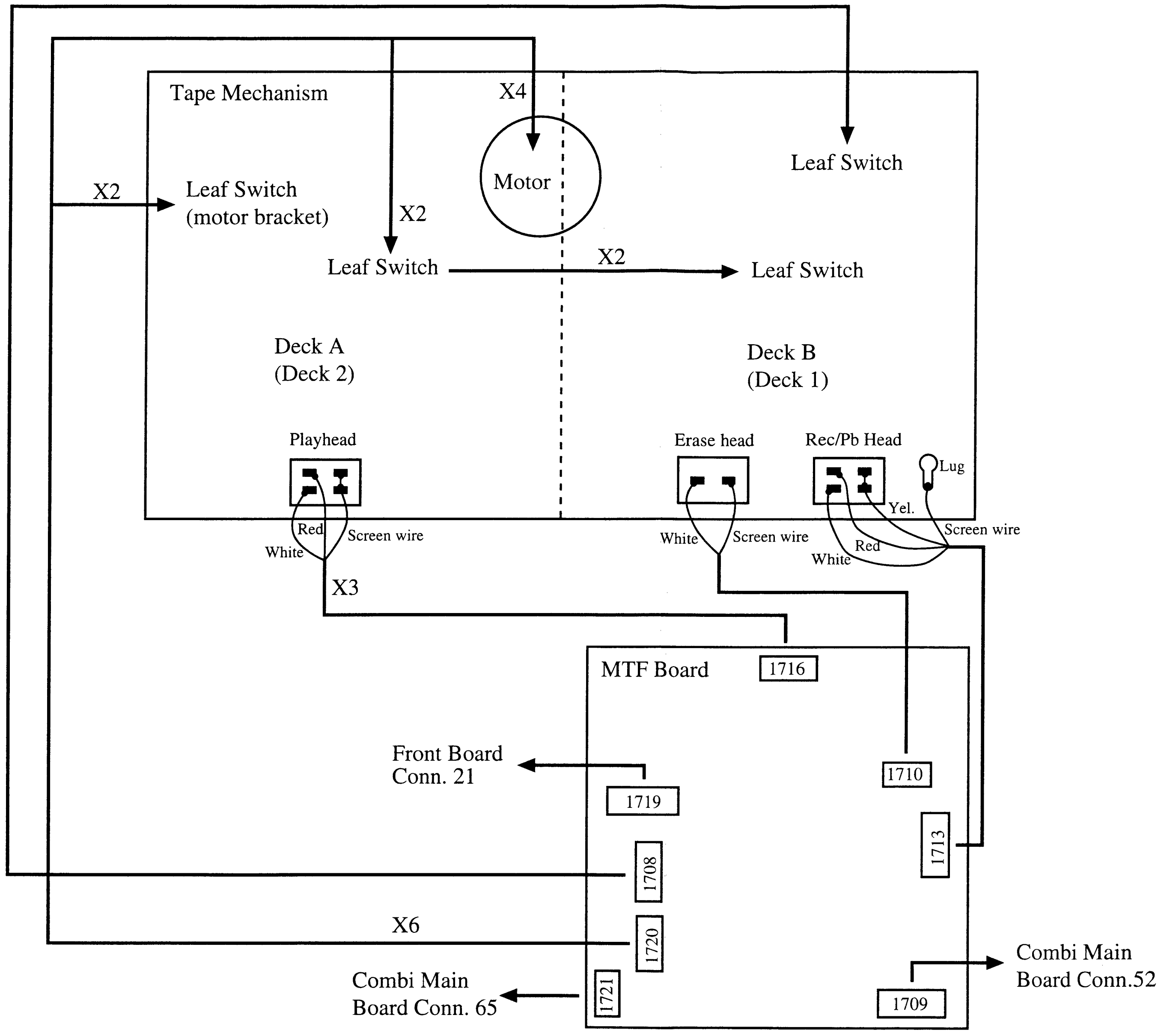
Note: Only the parts mentioned in this list are normal service spare parts.

MTF MODULE

TABLE OF CONTENTS

Tape Module Wiring & Adjustment table 9-1
Circuit Diagram 9-2
Layout Diagram 9-3
Exploded views & parts list.. 9-4
Electrical parts list.. 9-5

Tape Deck Wiring Diagram


Tape Mechanism
X4
Motor
Leaf Switch
X2
Leaf Switch
(motor bracket)
X2
Leaf Switch
X2
Leaf Switch
Deck A
(Deck 2)
Deck B
(Deck 1)
Playhead
Erase head
Rec/Pb Head
Lug
Yel.
Red
White
Screen wire
X3
White
Screen wire
Red
White
Screen wire
MTF Board
1716
Front Board
Conn. 21
1719
1710
1713
1708
1720
X6
Combi Main
Board Conn. 65
1721
1709
Combi Main
Board Conn.52

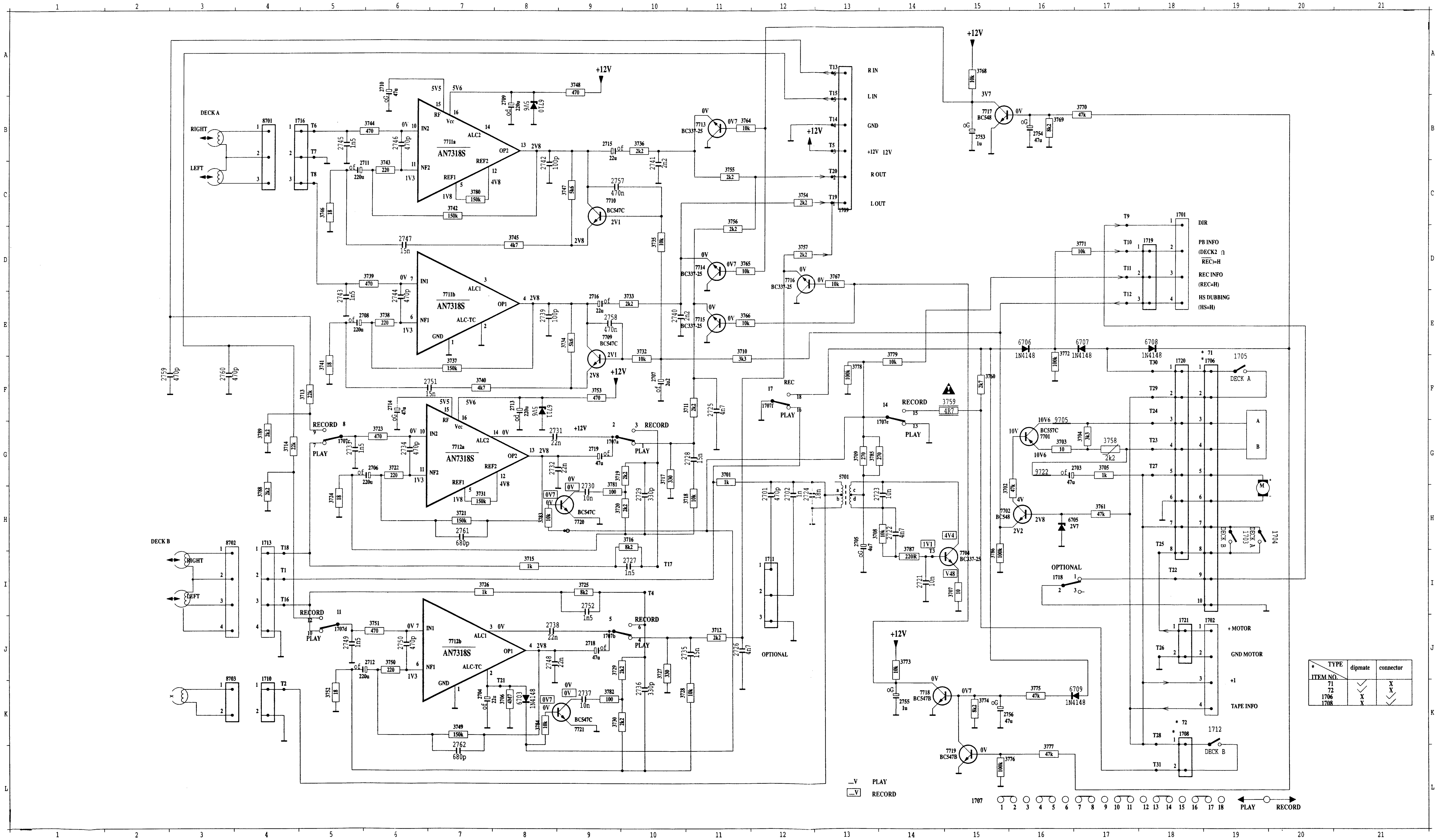
TAPE MECHANISM ADJUSTMENT

ADJUSTMENT	CASSETTE	DECK 1 (DECK B)	DECK 2 (DECK A)	MEASURE ON	READ ON	ADJUST WITH	ADJUST TO
Azimuth	10kHz	Play	-	L & R out T019/T020	mV-meter	Left hand screw of Play or R/P head	Maximum
	SBC420*	-	Play				L = R
Motor speed	3150Hz	Play	-	L & R out T019/T020	Wow and Futter meter	3758	**a
	SBC420*	-	Play				

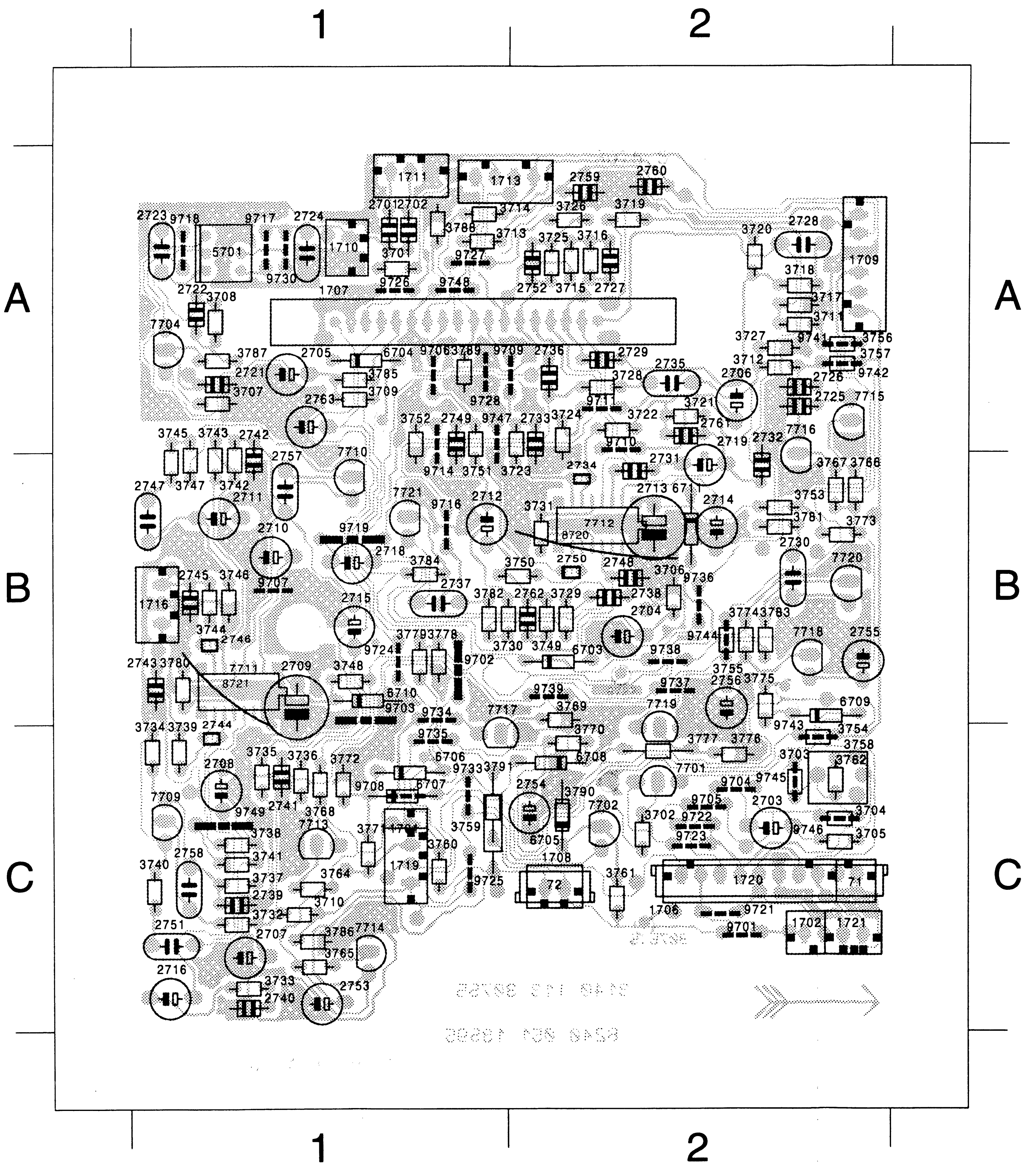
* SBC 420: 4822 397 30071
**a: The maximum permissible speed deviation is +3/-2%.
Moreover, the Wow & Flutter value can be read.
This value should not exceed 0.4%.

CIRCUIT DIAGRAM

1701	C18
1702	J19
1703	H19
1704	H20
1705	F19
1706	F19
1707a	G 9
1707b	J 9
1707c	G 5
1707d	J 5
1707e	G14
1707f	F12
1708	K18
1709	C13
1710	K 4
1711	I12
1712	K19
1713	H 4
1716	B 4
1718	I16
1719	D18
1720	F18
1721	J18
2701	H12
2702	H12
2703	G17
2704	K 7
2705	H13
2706	G 6
2707	F10
2708	E 6
2709	B 8
2710	A 6
2711	C 6
2712	J 6
2713	F 8
2714	F 6
2715	B 9
2716	E 9
2718	J 9
2719	G 9
2721	I14
2722	H14
2723	H14
2724	H12
2725	F11
2726	J11
2727	I10
2728	G11
2729	H10
2730	H 9
2731	G 8
2732	G 8
2733	G 5
2734	G 6
2735	J11
2736	K10
2737	K 9
2738	J 8
2739	E 8
2740	E10
2741	C10
2742	C 8
2743	E 5
2744	E 6
2745	B 5
2746	B 6
2747	D 6
2748	J 8
2749	J 5
2750	J 6
2751	F 7
2752	I 9
2753	B15
2754	B16
2755	K14
2756	K16
2757	C 9
2758	E 9
2759	F 2
2760	F 3
2761	H 7
2762	L 7
3701	G11
3702	H15
3703	G16
3704	G17
3705	G17
3706	K 8
3707	I15
3708	H13
3709	G13
3710	E11
3711	F11
3712	J11
3713	F 5
3714	G 4
3715	I 8
3716	H10
3717	G10
3718	H11
3719	G 9
3720	H 9
3721	H 7
3722	G 6
3723	G 6
3724	H 5
3725	I 9
3726	I 7
3727	J10
3728	K10
3729	J 9
3730	K 9
3731	H 7
3732	E10
3733	E10
3734	E 9
3735	D10
3736	B10
3737	F 7
3738	E 6
3739	D 6
3740	F 7
3741	F 5
3742	C 7
3743	C 6
3744	B 6
3745	D 8
3746	C 5
3747	C 9
3748	A 9
3749	K 7
3750	J 6
3751	J 6
3752	K 5
3753	F 9
3754	C12
3755	C11
3756	C11
3757	D12
3758	G17
3759	F15
3760	F15
3761	H17
3764	B11
3765	D11
3766	E11
3767	D13
3768	A15
3769	B16
3770	B17
3771	D17
3772	F16
3773	J14
3774	K15
3775	K16
3776	L16
3777	L16
3778	F13
3779	F14
3780	C 7
3781	H 9
3782	K 9
3783	H 8
3784	K 8
3785	G13
3786	I15
3787	I14
3788	H 4
3789	G 4
5701	G13
6703	K 8
6705	H17
6706	E16
6707	E17
6708	E18
6709	K17
6710	B 8
6711	F 8
7701	G16
7702	H16
7704	I15
7709	E 9
7710	C 9
7711a	B 7
7711b	E 7
7712a	G 7
7712b	J 7
7713	B11
7714	D11
7715	E11
7716	D12
7717	B15
7718	K14
7719	L15
7720	H 9
7721	K 9
8701	B 4
8702	H 3
8703	K 3
9705	G16
9722	G16

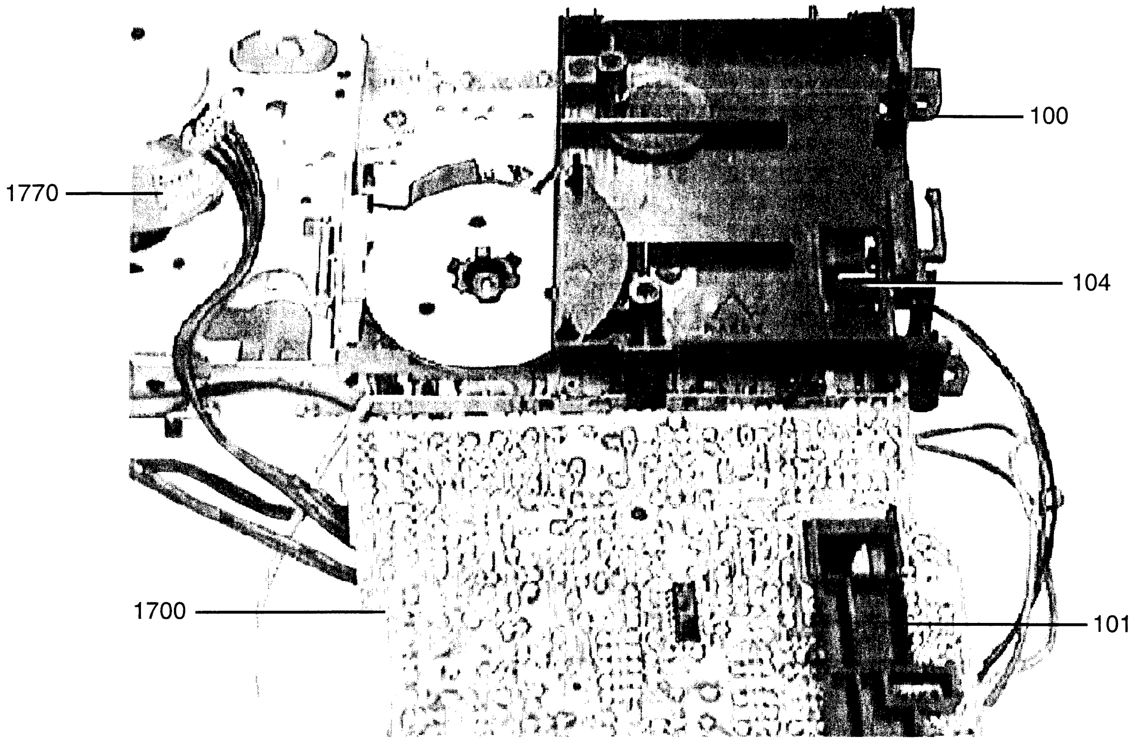

DECK A
RIGHT
LEFT
DECK B
RIGHT
LEFT
8701
8702
8703
1716
1713
1710
7711a AN7318S
7711b AN7318S
7712a AN7318S
7712b AN7318S
RF
Vcc
ALC2
ALC1
ALC-TC
REF1
REF2
NF1
NF2
IN1
IN2
OP1
OP2
GND
+12V
R IN
L IN
GND
+12V 12V
R OUT
L OUT
1709
DIR
PB INFO
(DECK2 Ո
REC)=H
REC INFO
(REC=H)
HS DUBBING
(HS=H)
1701
1719
1720
1706
1705
DECK A
1702
+MOTOR
GND MOTOR
+1
TAPE INFO
1721
1708
1712
DECK B
1703
1704
OPTIONAL
1718
1711
REC
PLAY
RECORD
5701
4R7
BC337-25
BC547C
BC547B
BC548
BC557C
1N4148
M
A
B
...V PLAY
...V RECORD
1707
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
PLAY
RECORD

* TYPE / ITEM NO.	dipmate	connector
71	✓	X
72	✓	X
1706	X	✓
1708	X	✓



71	C	2	2744	C	1	3737	C	1	6704	A	1	9741	A	2
72	C	2	2745	B	1	3738	C	1	6705	C	2	9742	A	2
1701	C	1	2746	B	1	3739	C	1	6706	C	1	9743	C	2
1702	C	2	2747	B	1	3740	C	1	6707	C	1	9744	B	2
1706	C	2	2748	B	2	3741	C	1	6708	C	2	9745	C	2
1707	A	1	2749	A	1	3742	B	1	6709	B	2	9746	C	2
1708	C	2	2750	B	2	3743	B	1	6710	B	1	9747	A	1
1709	A	2	2751	C	1	3744	B	1	6711	B	2	9748	A	1
1710	A	1	2752	A	2	3745	B	1	7701	C	2	9749	C	1
1711	A	1	2753	C	1	3746	B	1	7702	C	2			
1713	A	1	2754	C	2	3747	B	1	7704	A	1			
1716	B	1	2755	B	2	3748	B	1	7709	C	1			
1719	C	1	2756	B	2	3749	B	2	7710	B	1			
1720	C	2	2757	B	1	3750	B	2	7711	B	1			
1721	C	2	2758	C	1	3751	A	1	7712	B	2			
2701	A	1	2759	A	2	3752	A	1	7713	C	1			
2702	A	1	2760	A	2	3753	B	2	7714	C	1			
2703	C	2	2761	A	2	3754	C	2	7715	A	2			
2704	B	2	2762	B	2	3755	B	2	7716	B	2			
2705	A	1	2763	A	1	3756	A	2	7717	C	1			
2706	A	2	3701	A	1	3757	A	2	7718	B	2			
2707	C	1	3702	C	2	3758	C	2	7719	C	2			
2708	C	1	3703	C	2	3759	C	1	7720	B	2			
2709	B	1	3704	C	2	3760	C	1	7721	B	1			
2710	B	1	3705	C	2	3761	C	2	9701	C	2			
2711	B	1	3706	B	2	3762	C	2	9702	B	1			
2712	B	1	3707	A	1	3764	C	1	9703	B	1			
2713	B	2	3708	A	1	3765	C	1	9704	C	2			
2714	B	2	3709	A	1	3766	B	2	9705	C	2			
2715	B	1	3710	C	1	3767	B	2	9706	A	1			
2716	C	1	3711	A	2	3768	C	1	9707	B	1			
2718	B	1	3712	A	2	3769	B	2	9708	C	1			
2719	B	2	3713	A	1	3770	C	2	9709	A	2			
2721	A	1	3714	A	1	3771	C	1	9710	A	2			
2722	A	1	3715	A	2	3772	C	1	9711	A	2			
2723	A	1	3716	A	2	3773	B	2	9714	A	1			
2724	A	1	3717	A	2	3774	B	2	9716	B	1			
2725	A	2	3718	A	2	3775	B	2	9717	A	1			
2726	A	2	3719	A	2	3776	C	2	9718	A	1			
2727	A	2	3720	A	2	3777	C	2	9719	B	1			
2728	A	2	3721	A	2	3778	B	1	9721	C	2			
2729	A	2	3722	A	2	3779	B	1	9722	C	2			
2730	B	2	3723	A	2	3780	B	1	9723	C	2			
2731	B	2	3724	A	2	3781	B	2	9724	B	1			
2732	B	2	3725	A	2	3782	B	1	9725	C	1			
2733	A	2	3726	A	2	3783	B	2	9726	A	1			
2734	B	2	3727	A	2	3784	B	1	9727	A	1			
2735	A	2	3728	A	2	3785	A	1	9728	A	1			
2736	A	2	3729	B	2	3786	C	1	9730	A	1			
2737	B	1	3730	B	2	3787	A	1	9733	C	1			
2738	B	2	3731	B	2	3788	A	1	9734	B	1			
2739	C	1	3732	C	1	3789	A	1	9735	C	1			
2740	C	1	3733	C	1	3790	C	2	9736	B	2			
2741	C	1	3734	C	1	3791	C	1	9737	B	2			
2742	B	1	3735	C	1	5701	A	1	9738	B	2			
2743	B	1	3736	C	1	6703	B	2	9739	B	2			

MTF MODULE PICTURE



MECHANICAL PARTS LIST - MTF MODULE

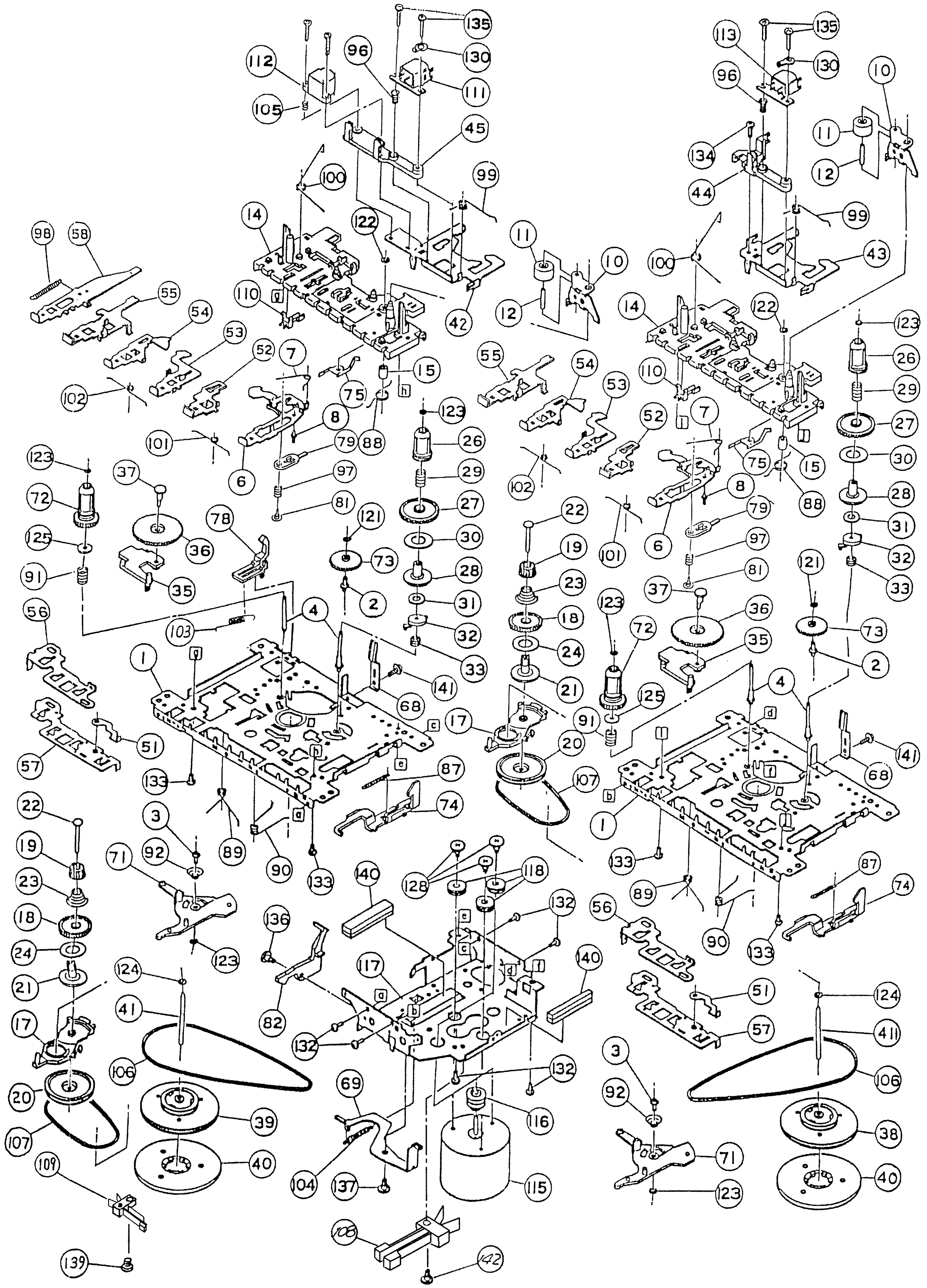
MTF MODULE		
101	4822 402 10126	Lever Recording
104	4822 492 11061	Spring Recording
1770	4822 691 10669	Tape Mechanism CDS-83WPC

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM		
10-12	4822 528 11189	Pinch Roller Assembly
17-24	4822 402 10966	FR Arm Assembly
38-41	4822 528 11242	Flywheel (W) Assembly
39-41	4822 528 11243	Flywheel Assembly
106	4822 358 31225	Main Belt (W2) 1.1x59.5
107	4822 358 31124	Sub Belt
108	4822 277 11753	Leaf Switch
109	4822 277 11754	Leaf Switch
110	4822 278 90663	Leaf Switch
111	4822 249 30218	Rec/PB Head
112	4822 249 10548	Erase Head
113	4822 249 30218	Play Head
115-116	4822 361 11053	Motor Assembly
118	4822 466 11787	Motor Cushion
122	4822 532 12937	Washer PSW-S 1.6x3.5x0.4

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM



ELECTRICAL PARTS LIST - MTF BOARD

MISCELLANEOUS

1707	4822 277 11504	Recording Switch

CAPACITORS

2703	4822 124 40433	47µF 20% 25V
2704	4822 124 81151	22µF 50V
2705	4822 124 40246	4,7µF 20% 63V
2706	4822 124 12068	220µF 20% 10V
2707	4822 124 41576	2,2µF 20% 50V
2708	4822 124 12068	220µF 20% 10V
2709	4822 124 80144	220µF 20% 25V
2710	4822 124 40433	47µF 20% 25V
2711	4822 124 12068	220µF 20% 10V
2712	4822 124 12068	220µF 20% 10V
2713	4822 124 80144	220µF 20% 25V
2714	4822 124 40433	47µF 20% 25V
2715	4822 124 81151	22µF 50V
2716	4822 124 81151	22µF 50V
2718	4822 124 40433	47µF 20% 25V
2719	4822 124 40433	47µF 20% 25V
2721	4822 121 51387	10nF 20% 16V
2722	4822 126 11714	4,7nF 20%
2723	4822 121 41857	10nF 5% 250V
2724	4822 121 51306	18nF 10% 50V
2725	4822 126 11714	4,7nF 20%
2726	4822 126 11714	4,7nF 20%
2727	4822 126 12878	1,5nF 10% 16V
2728	4822 121 51305	15nF 10% 50V
2729	4822 126 12787	330pF 10% 50V
2730	4822 121 51304	10nF 10% 50V
2731	4822 126 11585	22nF +80/-20% 25V
2732	4822 126 11585	22nF +80/-20% 25V
2733	4822 126 12878	1,5nF 10% 16V
2734	5322 122 32311	470pF 10% 100V
2735	4822 121 51305	15nF 10% 50V
2736	4822 126 12787	330pF 10% 50V
2737	4822 121 51304	10nF 10% 50V
2738	4822 126 11585	22nF +80/-20% 25V
2739	4822 122 33195	100pF 10% 50V
2740	4822 126 12339	2,2nF 10% Y5R
2741	4822 126 12339	2,2nF 10% Y5R
2742	4822 122 33195	100pF 10% 50V
2743	4822 126 12878	1,5nF 10% 16V
2744	5322 122 32311	470pF 10% 100V
2745	4822 126 12878	1,5nF 10% 16V
2746	5322 122 32311	470pF 10% 100V
2747	4822 121 51305	15nF 10% 50V
2748	4822 126 11585	22nF +80/-20% 25V
2749	4822 126 12878	1,5nF 10% 16V
2750	5322 122 32311	470pF 10% 100V
2751	4822 121 51305	15nF 10% 50V
2752	4822 126 12878	1,5nF 10% 16V
2753	4822 124 40242	1µF 20% 63V
2754	4822 124 40433	47µF 20% 25V
2755	4822 124 40242	1µF 20% 63V
2756	4822 124 40433	47µF 20% 25V
2757	4822 121 51252	470nF 5% 63V
2758	4822 121 51252	470nF 5% 63V
2759	4822 122 33519	470pF 10% 50V
2760	4822 122 33519	470pF 10% 50V
2761	4822 126 14316	680pF 10% 50V
2762	4822 126 14316	680pF 10% 50V

RESISTORS

3701	4822 050 21002	1k 1% 0,6W
3702	4822 116 83884	47k 5% 0,5W
3703	4822 050 11009	10R 1% 0,4W
3704	4822 050 13302	3k3 1% 0,4W
3705	4822 050 21002	1k 1% 0,6W
3706	4822 111 30893	4M7 5% 0,2W
3707	4822 116 52176	10R 5% 0,5W
3708	4822 050 11003	10k 1% 0,4W
3709	4822 111 20434	270R
3710	4822 116 52269	3k3 5% 0,5W
3711	4822 050 12202	2k2 1% 0,4W
3712	4822 050 12202	2k2 1% 0,4W
3713	4822 116 52257	22k 5% 0,5W
3714	4822 116 52257	22k 5% 0,5W
3715	4822 050 11002	1k 1% 0,4W
3716	4822 050 18202	8k2 1% 0,4W
3717	4822 116 52219	330R 5% 0,5W
3718	4822 050 11003	10k 1% 0,4W
3719	4822 050 12202	2k2 1% 0,4W
3720	4822 050 12202	2k2 1% 0,4W
3721	4822 116 52245	150k 5% 0,5W
3722	4822 116 83872	220R 5% 0,5W
3723	4822 116 83883	470R 5% 0,5W
3724	4822 116 52184	18R 5% 0,5W
3725	4822 050 18202	8k2 1% 0,4W
3726	4822 050 11002	1k 1% 0,4W
3727	4822 116 52219	330R 5% 0,5W
3728	4822 050 11003	10k 1% 0,4W
3729	4822 050 12202	2k2 1% 0,4W
3730	4822 050 12202	2k2 1% 0,4W
3731	4822 116 52245	150k 5% 0,5W
3732	4822 116 83864	10k 5% 0,5W
3733	4822 116 52256	2k2 5% 0,5W
3734	4822 050 15602	5k6 1% 0,4W
3735	4822 116 83864	10k 5% 0,5W
3736	4822 116 52256	2k2 5% 0,5W
3737	4822 116 52245	150k 5% 0,5W
3738	4822 116 83872	220R 5% 0,5W
3739	4822 116 83883	470R 5% 0,5W
3740	4822 116 52283	4k7 5% 0,5W
3741	4822 116 52184	18R 5% 0,5W

ELECTRICAL PARTS LIST - MTF BOARD

RESISTORS

3742	4822 116 52245	150k 5% 0,5W
3743	4822 116 83872	220R 5% 0,5W
3744	4822 116 83883	470R 5% 0,5W
3745	4822 116 52283	4k7 5% 0,5W
3746	4822 116 52184	18R 5% 0,5W
3747	4822 050 15602	5k6 1% 0,4W
3748	4822 116 83883	470R 5% 0,5W
3749	4822 116 52245	150k 5% 0,5W
3750	4822 116 83872	220R 5% 0,5W
3751	4822 116 83883	470R 5% 0,5W
3752	4822 116 52184	18R 5% 0,5W
3753	4822 116 83883	470R 5% 0,5W
3754	4822 050 12202	2k2 1% 0,4W
3755	4822 050 12202	2k2 1% 0,4W
3756	4822 050 12202	2k2 1% 0,4W
3757	4822 050 12202	2k2 1% 0,4W
3758	4822 101 11166	Trimmer 2k2
3759	4822 052 10478 ⚠	4R7 5% 0,33W
3760	4822 050 12702	2k7 1% 0,4W
3761	4822 116 83884	47k 5% 0,5W
3764	4822 116 83864	10k 5% 0,5W
3765	4822 116 83864	10k 5% 0,5W
3766	4822 050 11003	10k 1% 0,4W
3767	4822 050 11003	10k 1% 0,4W
3768	4822 116 83864	10k 5% 0,5W
3769	4822 050 18202	8k2 1% 0,4W
3770	4822 116 83884	47k 5% 0,5W
3771	4822 116 83864	10k 5% 0,5W
3772	4822 116 52234	100k 5% 0,5W
3773	4822 050 11003	10k 1% 0,4W
3774	4822 050 18202	8k2 1% 0,4W
3775	4822 116 83884	47k 5% 0,5W
3776	4822 050 11004	100k 1% 0,4W
3777	4822 116 83884	47k 5% 0,5W
3778	4822 116 52234	100k 5% 0,5W
3779	4822 116 83864	10k 5% 0,5W
3780	4822 050 11504	150k 1% 0,4W
3781	4822 050 11001	100R 1% 0,4W
3782	4822 050 11001	100R 1% 0,4W
3783	4822 116 83864	10k 5% 0,5W
3784	4822 116 83864	10k 5% 0,5W
3785	4822 111 20434	270R
3786	4822 116 52234	100k 5% 0,5W
3787	4822 116 83872	220R 5% 0,5W
3788	4822 050 12202	2k2 1% 0,4W
3789	4822 050 12202	2k2 1% 0,4W

COILS

5701	4822 157 10371	Osc Coil 100kHz

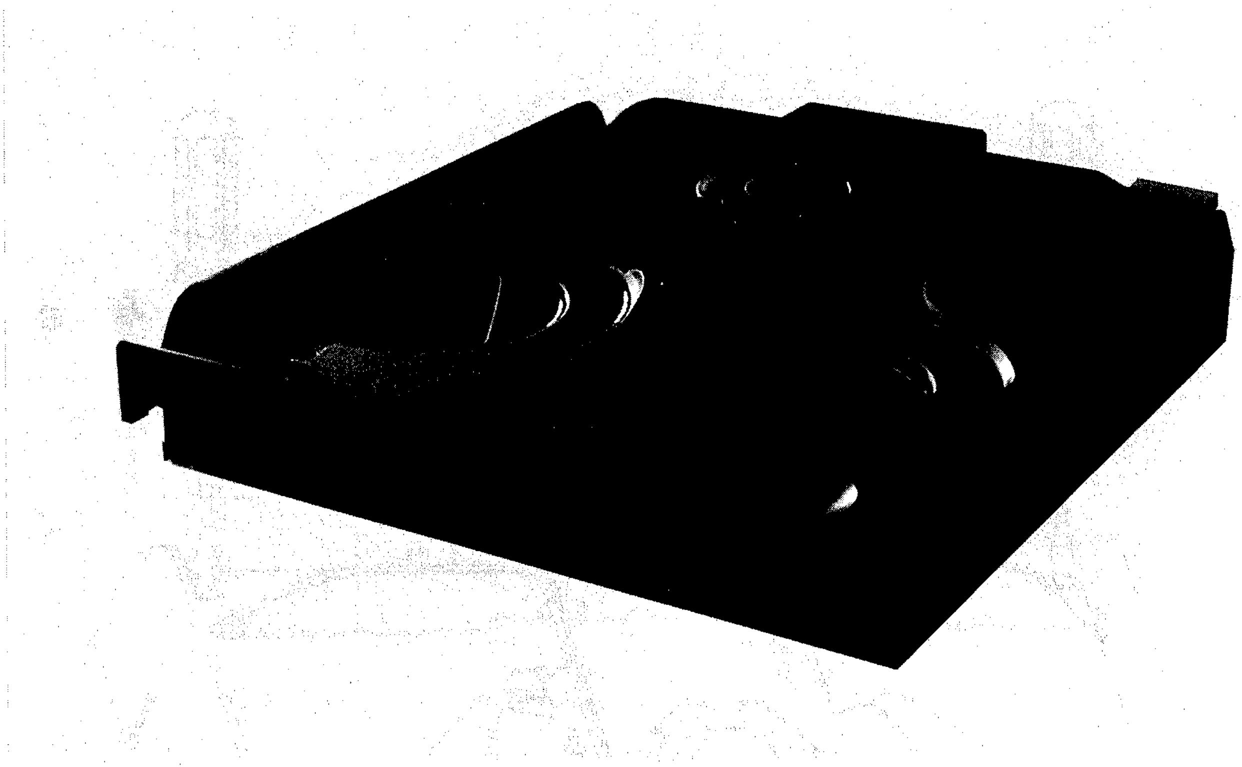
DIODES

6703	4822 130 30621	1N4148
6705	5322 130 34563	BZX79-C2V7
6706	4822 130 30621	1N4148
6707	4822 130 30621	1N4148
6708	4822 130 30621	1N4148
6709	4822 130 30621	1N4148
6710	4822 130 34173	BZX79-B5V6
6711	4822 130 34173	BZX79-B5V6

TRANSISTORS & INTEGRATED CIRCUITS

7701	4822 130 42231	BC557C
7702	4822 130 40938	BC548
7704	4822 130 40981	BC337-25
7709	4822 130 44503	BC547C
7710	4822 130 44503	BC547C
7711	4822 209 32918	AN7318S
7712	4822 209 32918	AN7318S
7713	4822 130 40981	BC337-25
7714	4822 130 40981	BC337-25
7715	4822 130 40981	BC337-25
7716	4822 130 40981	BC337-25
7717	4822 130 40938	BC548
7718	4822 130 40959	BC547B
7719	4822 130 40959	BC547B
7720	4822 130 44503	BC547C
7721	4822 130 44503	BC547C

Note: Only the parts mentioned in this list are normal service spare parts.



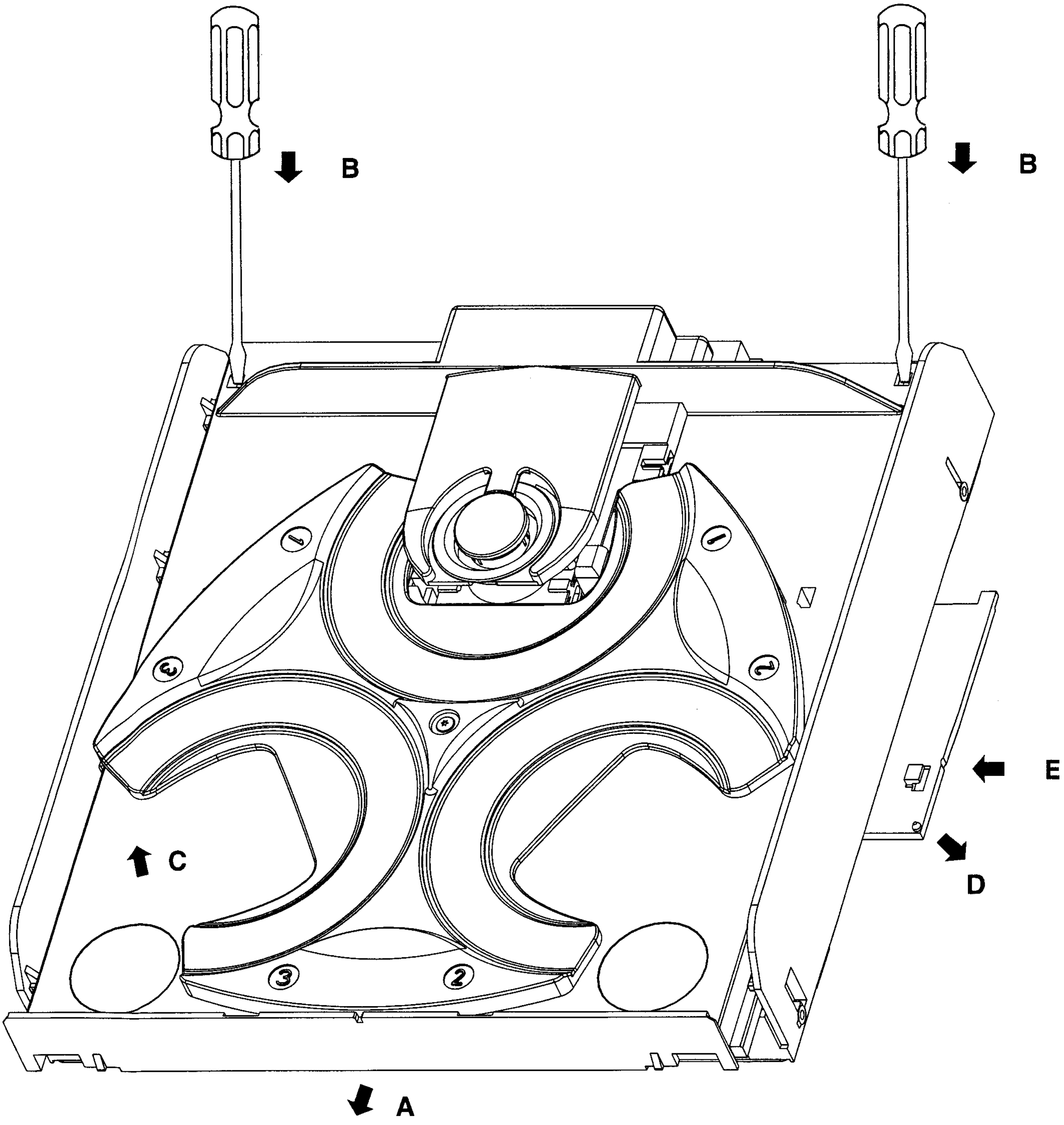
3CDC Module

(3 Disc Carrousel Changer)

TABLE OF CONTENTS

Demounting Hints 10-2
Servicing Hints 10-3
Lubrication Instructions 10-4
ESD Warnings 10-6
Blockdiagram 10-7
Wiring Diagram 10-8
Connector Board 10-9
Optical Out (not on all versions) 10-9
Component Layout Main Board 10-10
Circuit Diagram part1 10-11
Component Layout Main Board 10-12
Circuit Diagram part2 10-13
Exploded View 10-14
Mechanical Partslist 10-14
Electrical Partslist 10-15

Demounting Hints



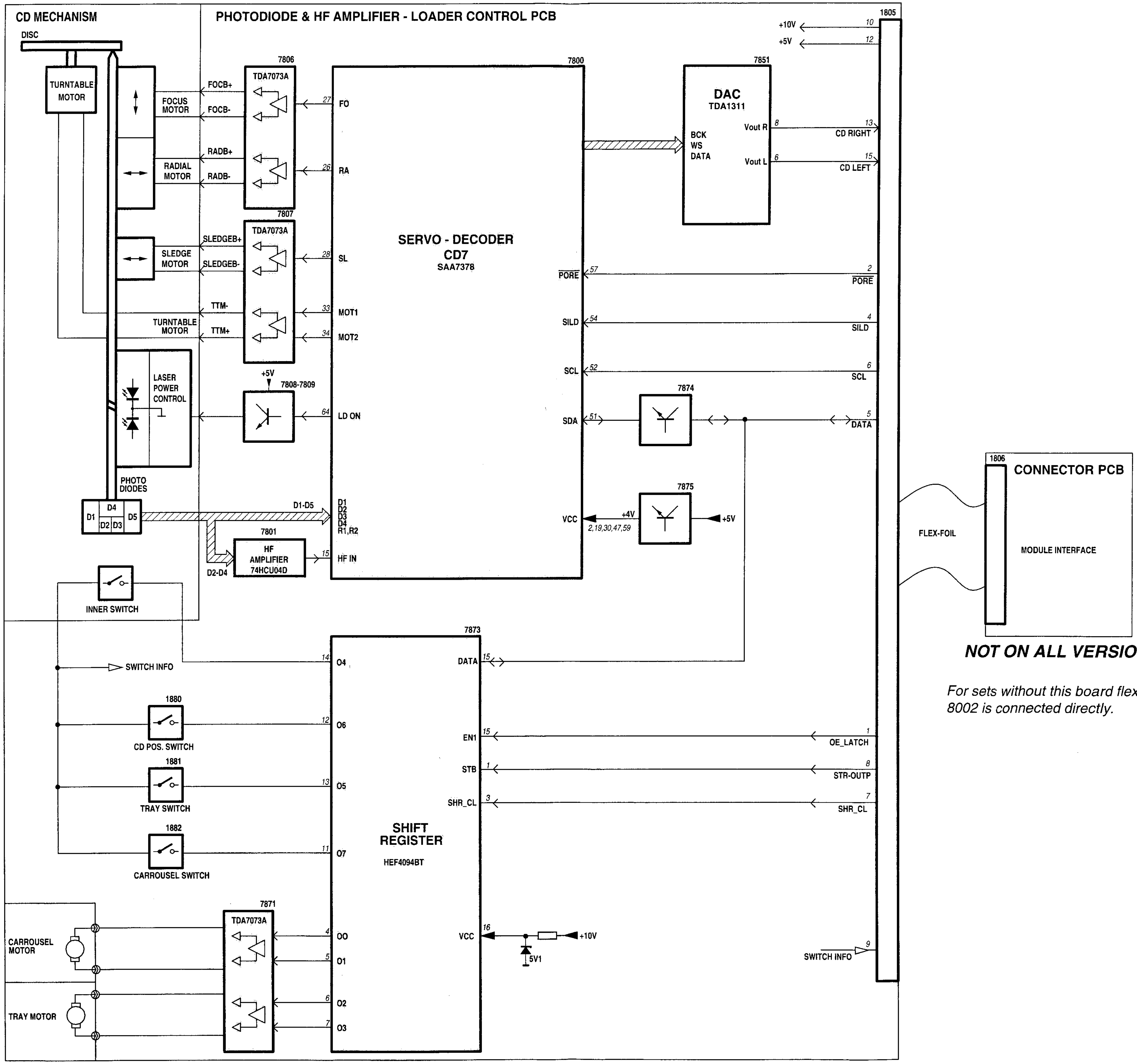
Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

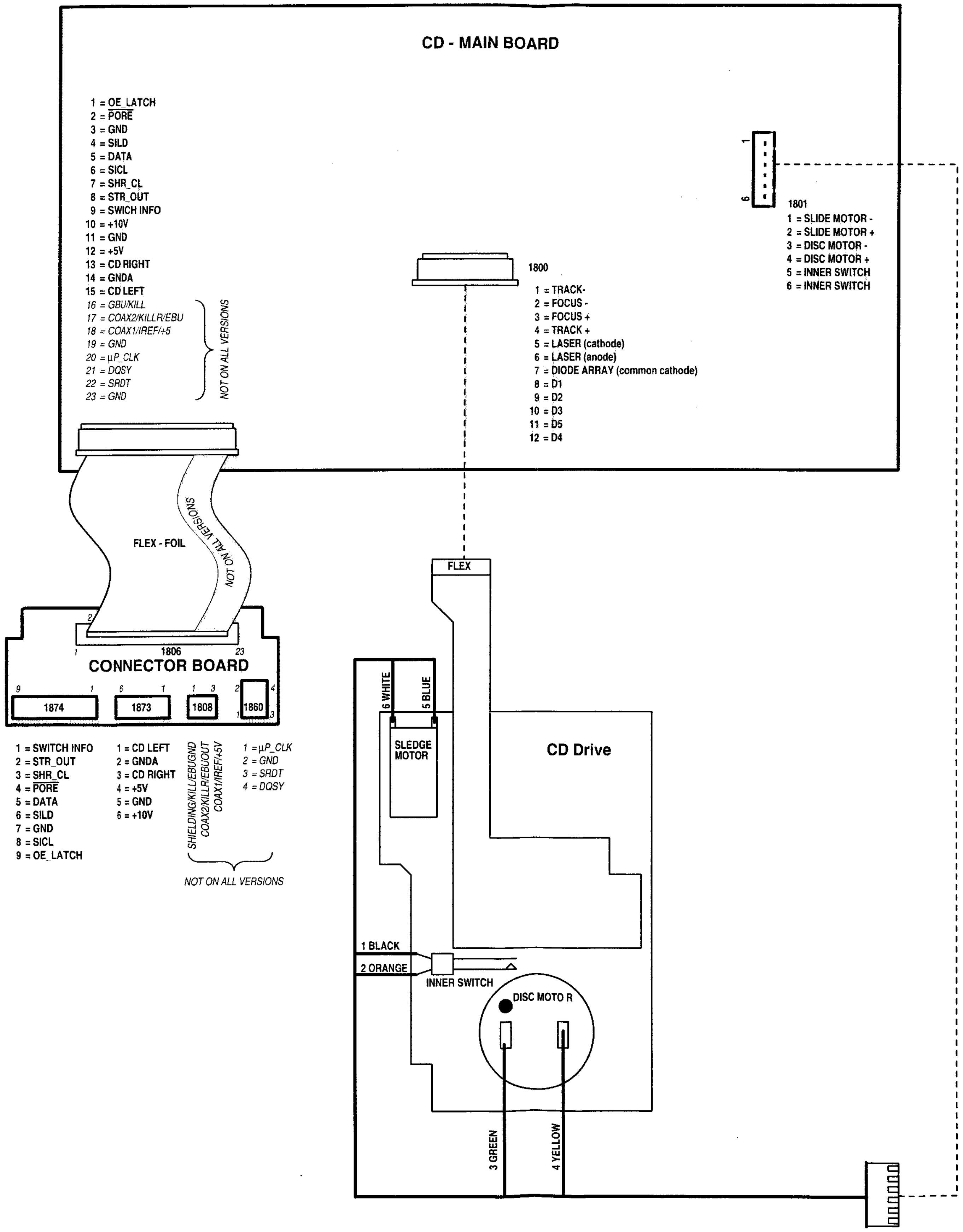
Blockdiagram


CD MECHANISM
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER POWER CONTROL
PHOTO DIODES
D1
D2
D3
D4
D5
INNER SWITCH
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
7806
TDA7073A
FOCB+
FOCB-
RADB+
RADB-
7807
TDA7073A
SLEDGEB+
SLEDGEB-
TTM-
TTM+
+5V
7808-7809
D1-D5
D2-D4
7801
HF AMPLIFIER
74HCU04D
7800
SERVO - DECODER
CD7
SAA7378
FO
RA
SL
MOT1
MOT2
LD ON
D1
D2
D3
D4
R1,R2
HF IN
PORE
SILD
SCL
SDA
VCC
+4V
2,19,30,47,59
7874
7875
+5V
7851
DAC
TDA1311
BCK
WS
DATA
Vout R
Vout L
CD RIGHT
CD LEFT
1805
+10V
+5V
PORE
SILD
SCL
DATA
OE_LATCH
STR-OUTP
SHR_CL
SWITCH INFO
SWITCH INFO
1880
CD POS. SWITCH
1881
TRAY SWITCH
1882
CARROUSEL SWITCH
7873
SHIFT REGISTER
HEF4094BT
O4
O6
O5
O7
O0
O1
O2
O3
DATA
EN1
STB
SHR_CL
VCC
+10V
5V1
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR
FLEX-FOIL
1806
CONNECTOR PCB
MODULE INTERFACE

NOT ON ALL VERSIONS

For sets without this board flexfoil 8002 is connected directly.

Wiring diagram


CD - MAIN BOARD
1 = OE_LATCH
2 = PORE
3 = GND
4 = SILD
5 = DATA
6 = SICL
7 = SHR_CL
8 = STR_OUT
9 = SWICH INFO
10 = +10V
11 = GND
12 = +5V
13 = CD RIGHT
14 = GNDA
15 = CD LEFT
16 = GBU/KILL
17 = COAX2/KILLR/EBU
18 = COAX1/IREF/+5
19 = GND
20 = µP_CLK
21 = DQSY
22 = SRDT
23 = GND
NOT ON ALL VERSIONS
1800
1 = TRACK-
2 = FOCUS -
3 = FOCUS +
4 = TRACK +
5 = LASER (cathode)
6 = LASER (anode)
7 = DIODE ARRAY (common cathode)
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
1
6
1801
1 = SLIDE MOTOR -
2 = SLIDE MOTOR +
3 = DISC MOTOR -
4 = DISC MOTOR +
5 = INNER SWITCH
6 = INNER SWITCH
FLEX - FOIL
NOT ON ALL VERSIONS
2
1
1806
23
CONNECTOR BOARD
9
1
1874
6
1
1873
1
3
1808
2
4
1
3
1860
1 = SWITCH INFO
2 = STR_OUT
3 = SHR_CL
4 = PORE
5 = DATA
6 = SILD
7 = GND
8 = SICL
9 = OE_LATCH
1 = CD LEFT
2 = GNDA
3 = CD RIGHT
4 = +5V
5 = GND
6 = +10V
SHIELDING/KILL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
1 = µP_CLK
2 = GND
3 = SRDT
4 = DQSY
NOT ON ALL VERSIONS
FLEX
6 WHITE
5 BLUE
SLEDGE MOTOR
CD Drive
1 BLACK
2 ORANGE
INNER SWITCH
DISC MOTO R
3 GREEN
4 YELLOW

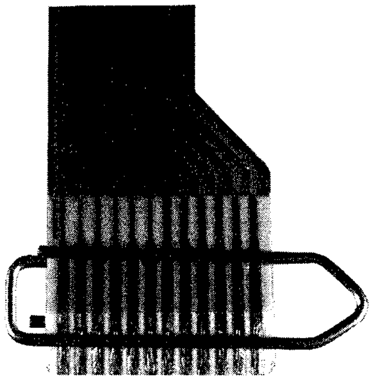
Remarks

Servicing Hints

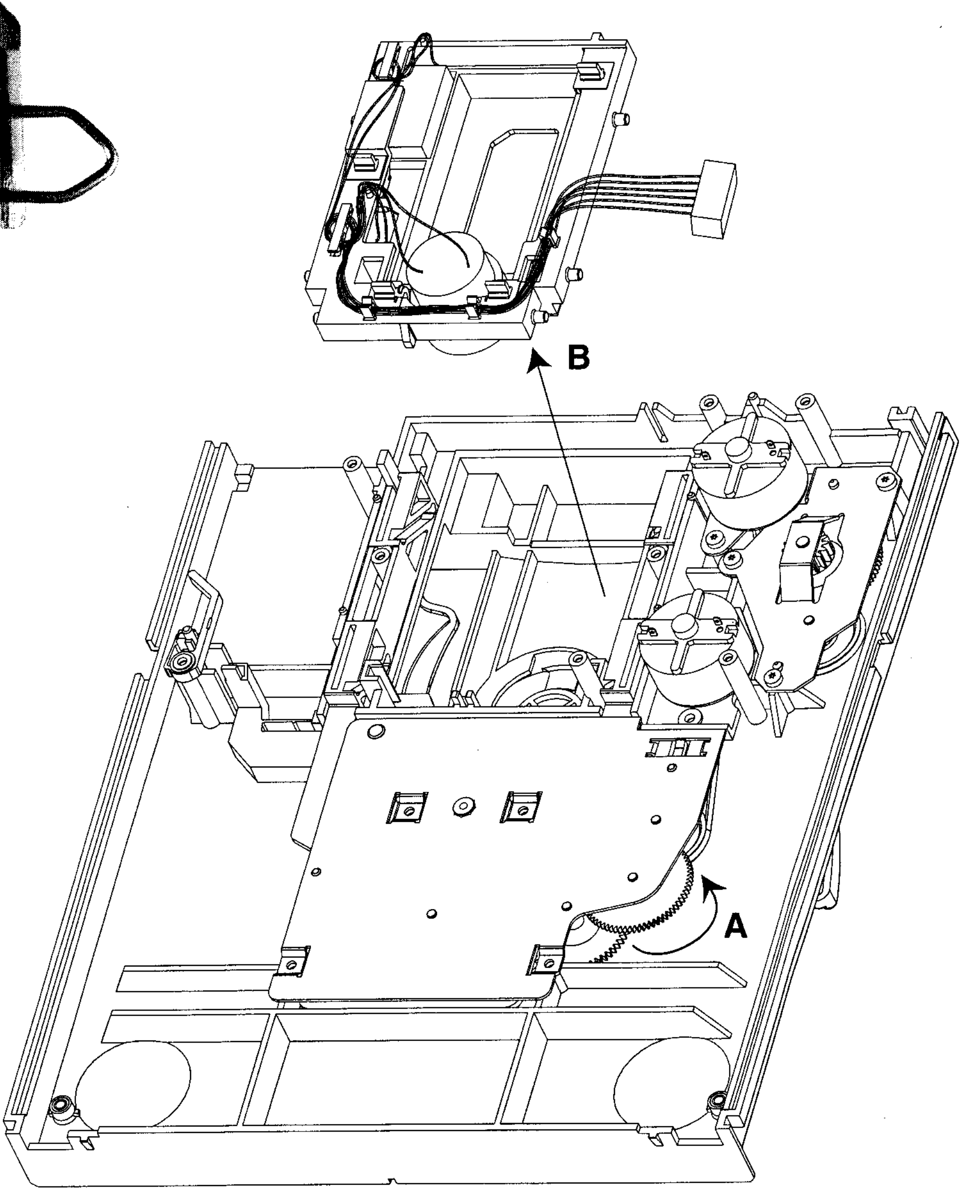
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount flex plate (pos 140).
2. Demount printed circuit board: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
4. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
5. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
6. Demount CD drive support (pos 95) Ⓑ.
7. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

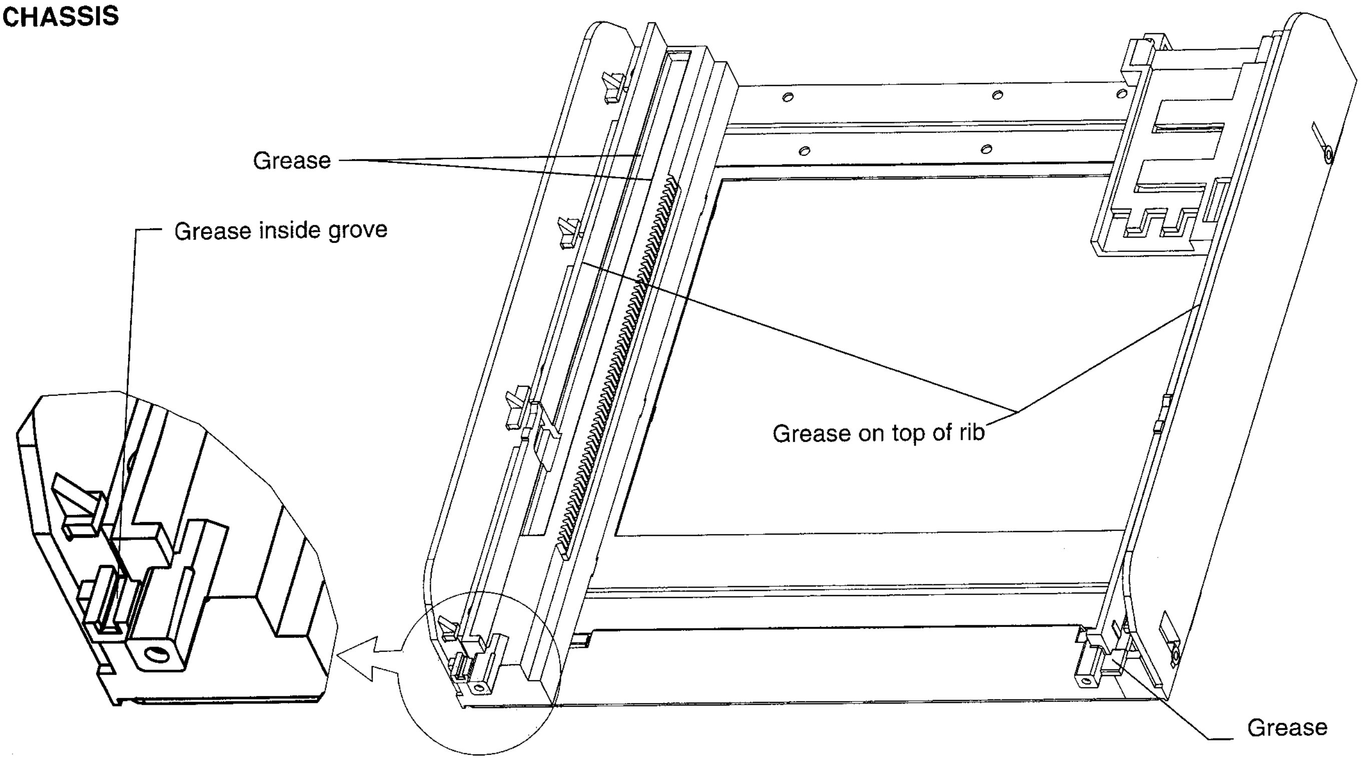


Mounting of Carrousel

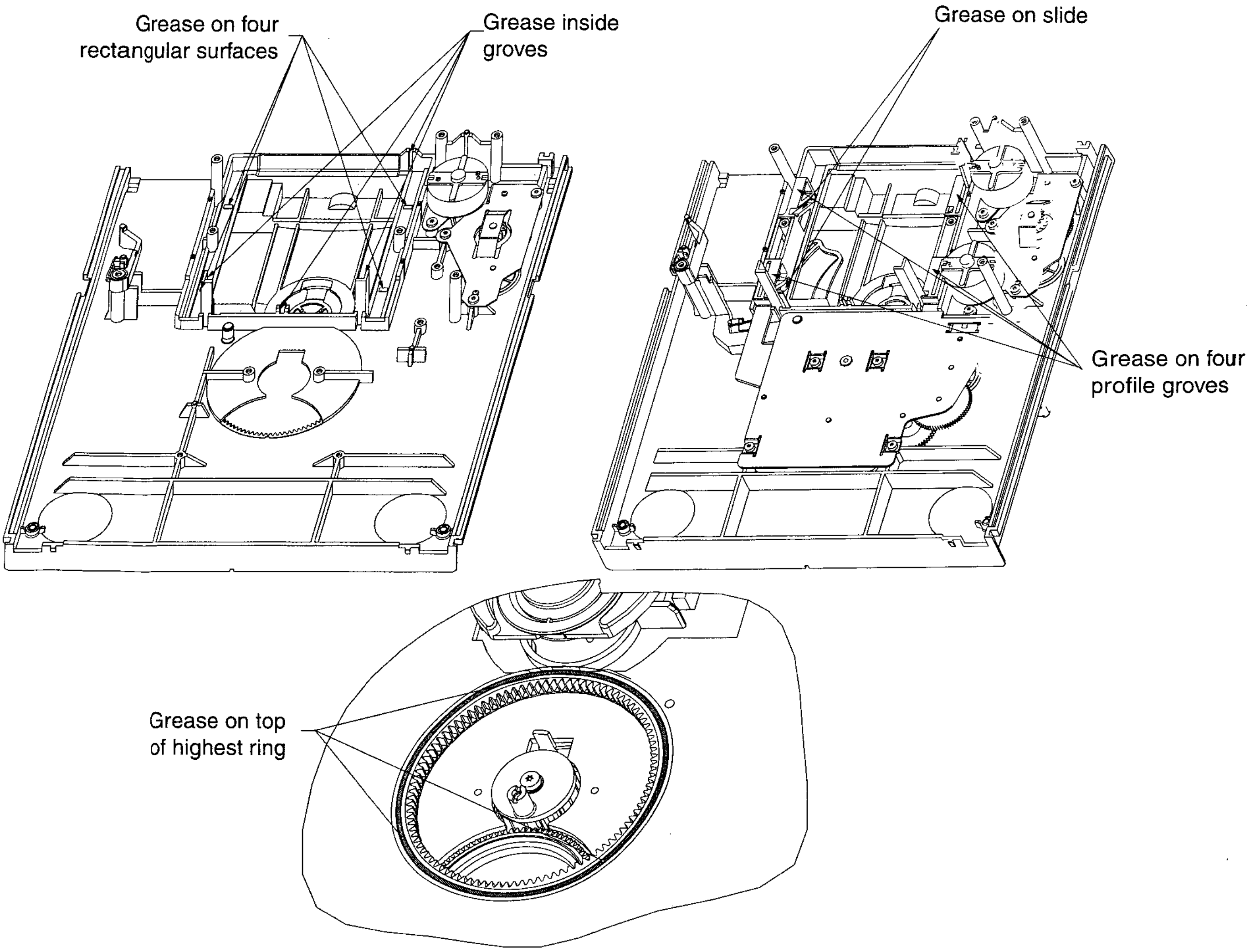
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

Lubrication Instructions

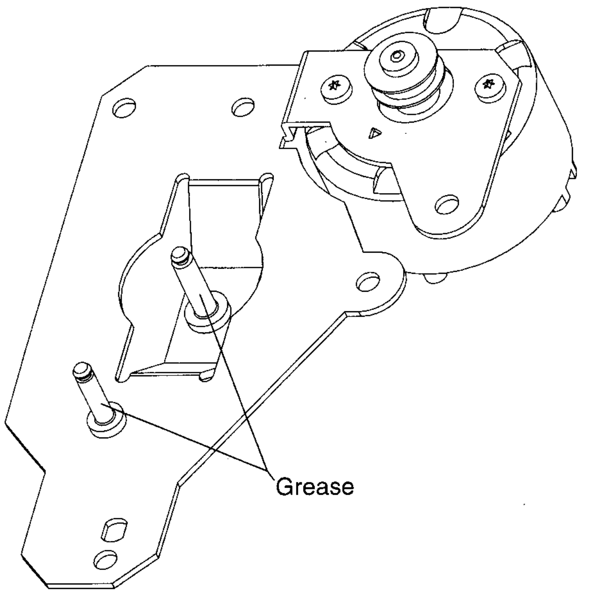
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

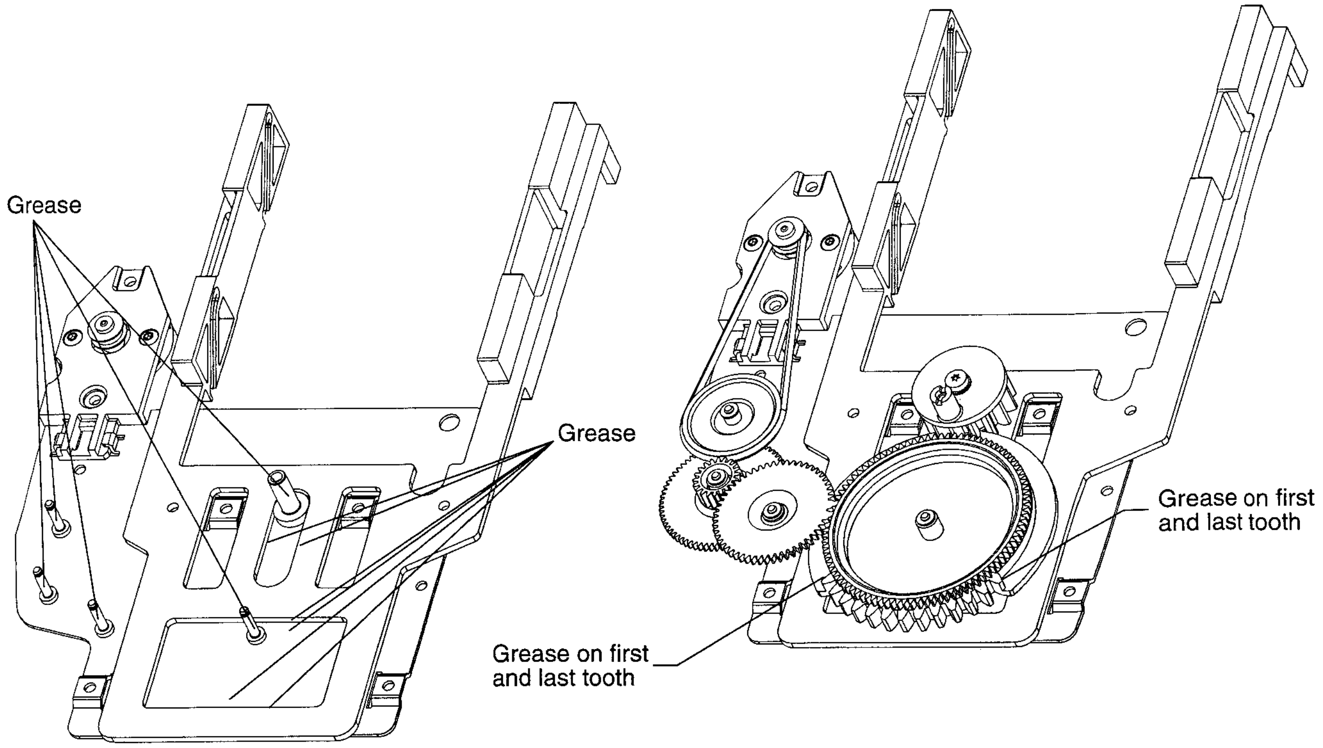
DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

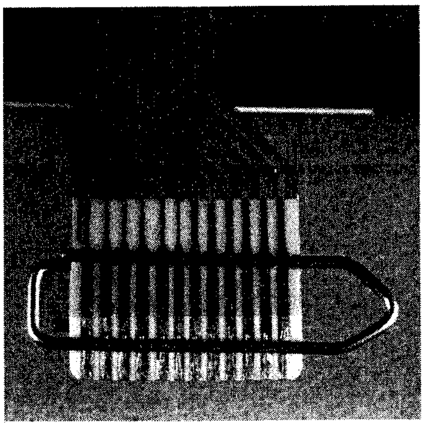


fig.1

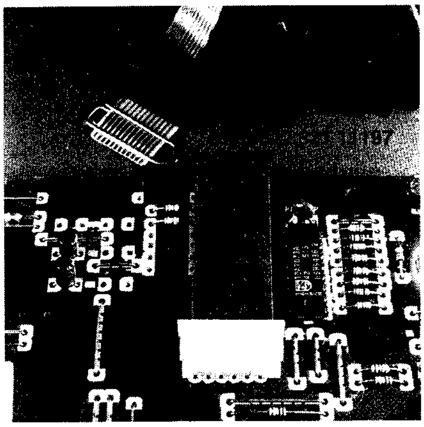


fig.2

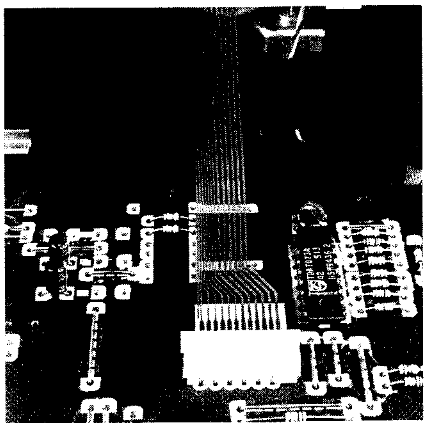
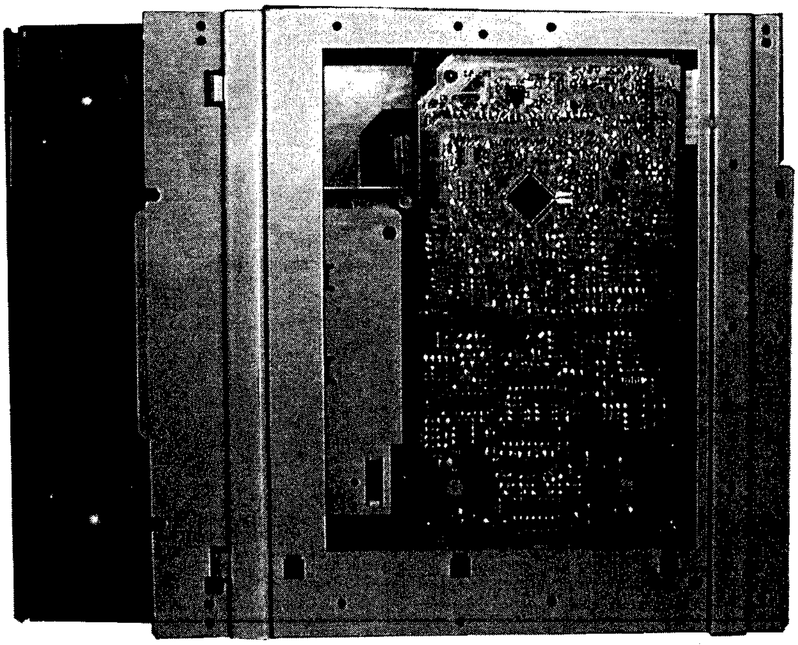


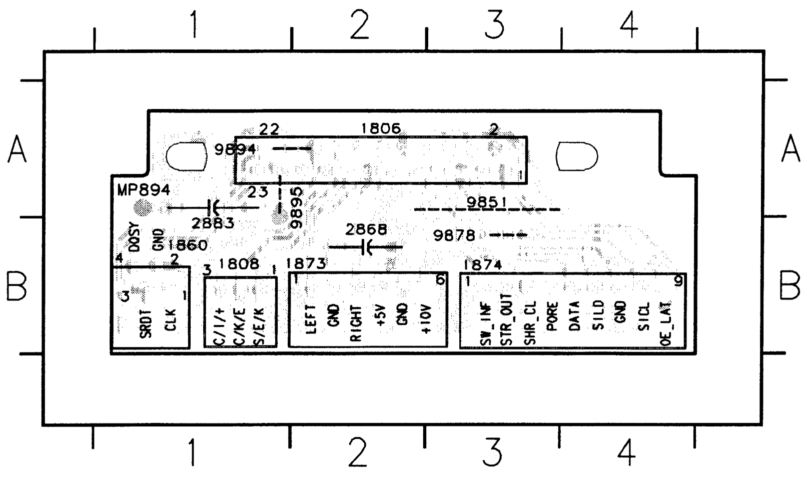
fig.3

Service Position

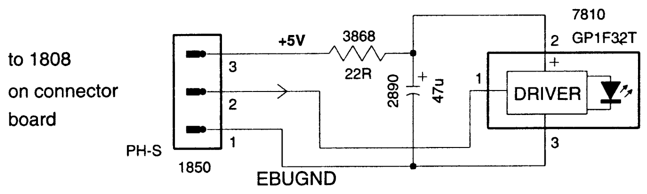


Connector Board Copperside view

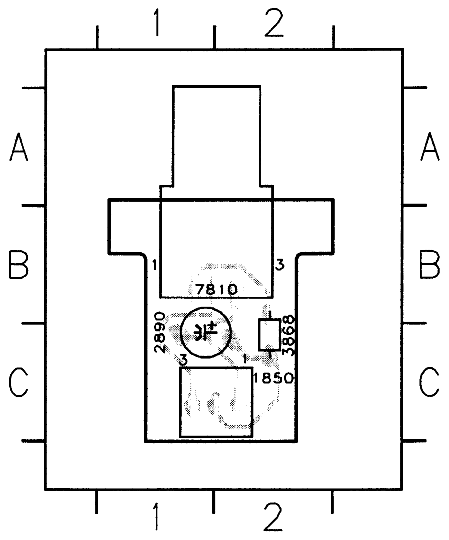
1806	A2
1808	B1
1860	B1
1873	B2
1874	B3
2868	B2
2883	B1
9851	A3
9878	B3
9894	A1
9895	A2
MP894	A1


1
2
3
4
A
B
22
1806
2
9894
23
9895
MP894
2883
9851
2868
9878
DQSY
GND
1860
1808
1873
1874
SRDT
CLK
C/I/+
C/K/E
S/E/K
LEFT
GND
RIGHT
+5V
GND
+10V
SW_INF
STR_OUT
SHR_CL
PORE
DATA
SILD
GND
SICL
OE_LAT

Circuit Diagram Optical out


to 1808
on connector
board
PH-S
1850
+5V
3868
22R
2890
47u
7810
GP1F32T
DRIVER
EBUGND
1
2
3

Component Layout Optical out

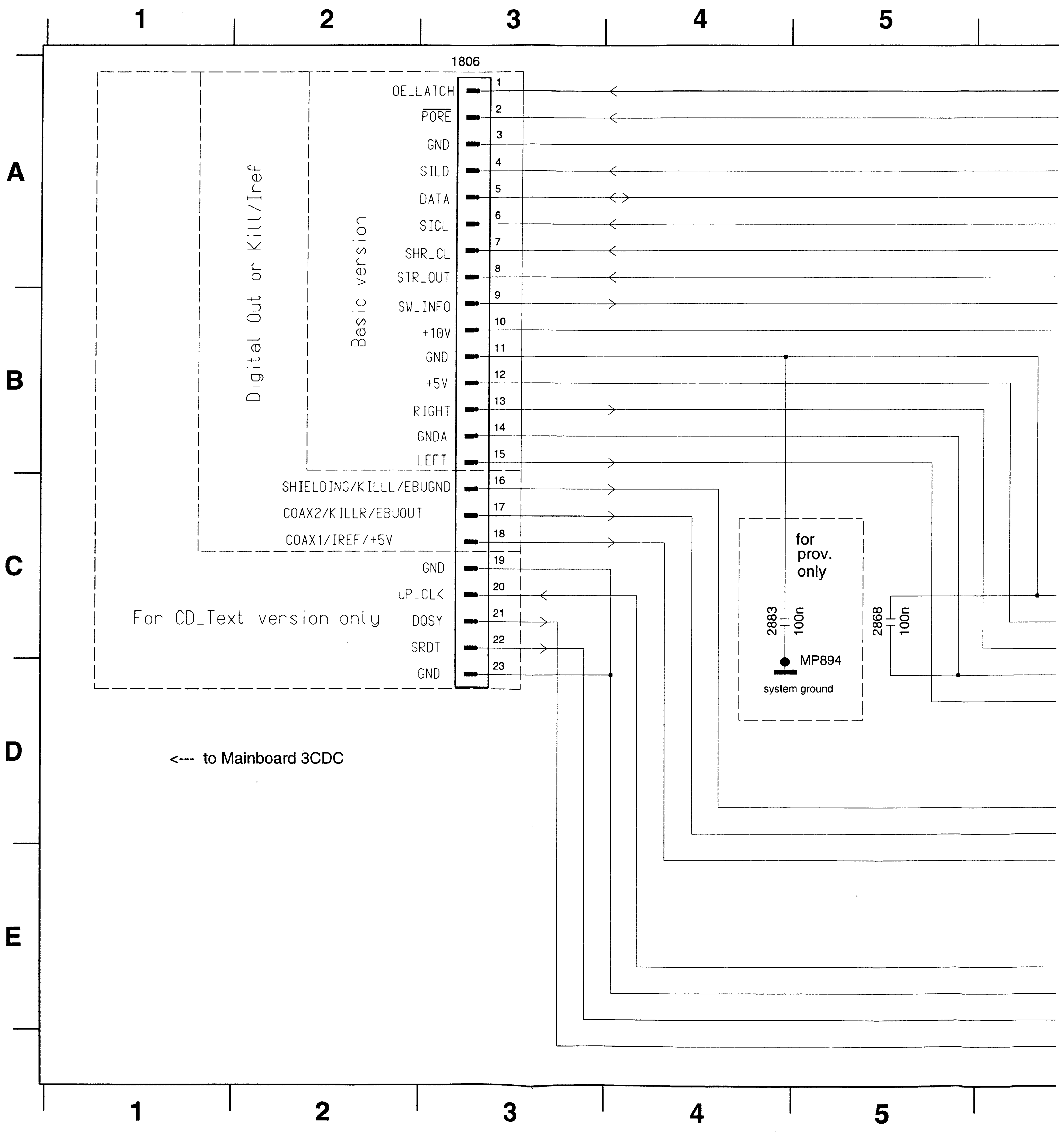

1
2
A
B
C
7810
2890
3868
1850

1850	C2
2890	C1
3868	C2
7810	B1

NOT ON ALL VERSIONS

Circuit diagram Connector Board

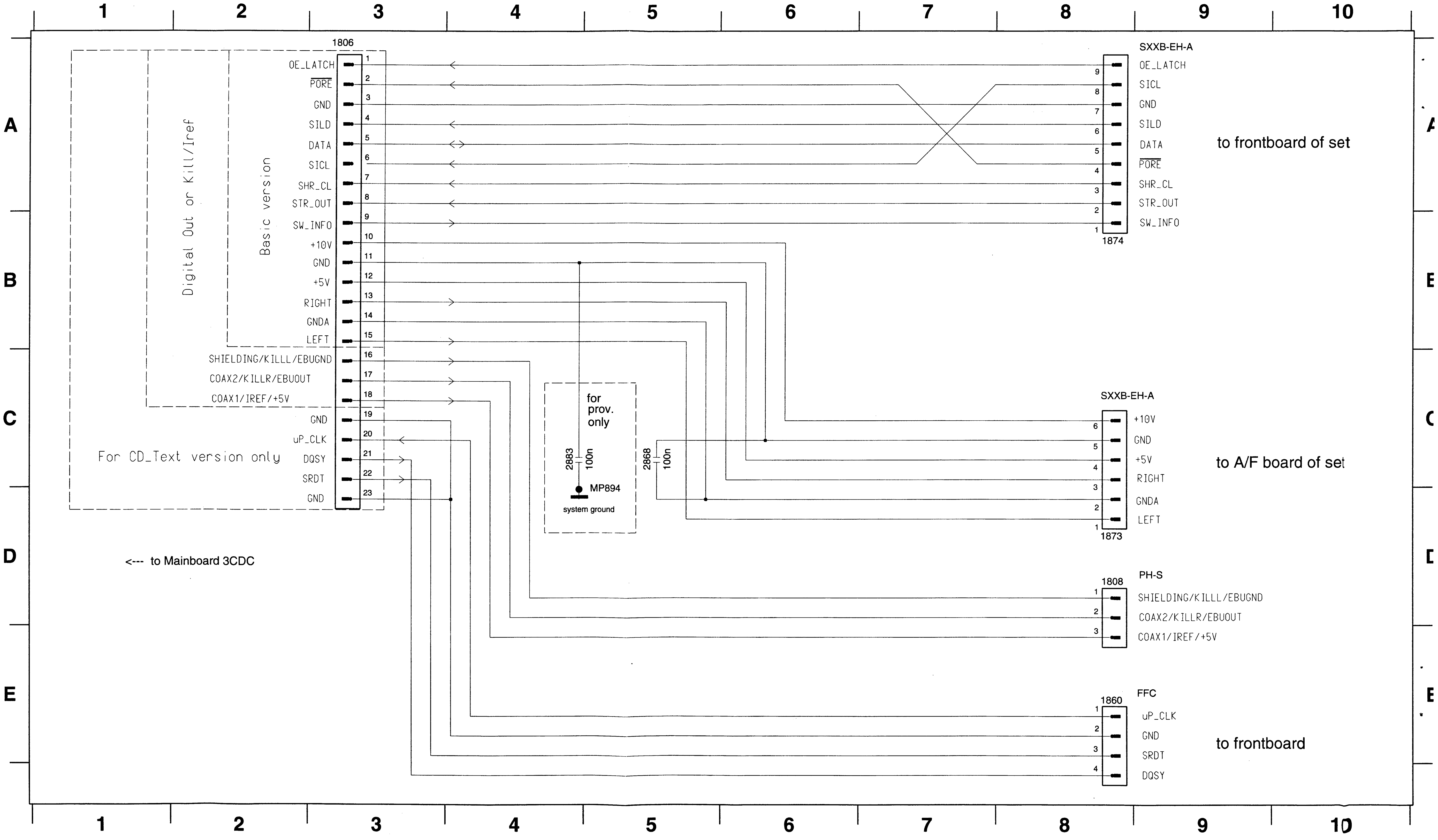
1806	A3
1808	D8
1860	E8
1873	D8
1874	B8
2868	C5
2883	C4


1
2
3
4
5
A
B
C
D
E
1806
OE_LATCH
PORE
GND
SILD
DATA
SICL
SHR_CL
STR_OUT
SW_INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DQSY
SRDT
GND
Digital Out or Kill/Iref
Basic version
For CD_Text version only
for
prov.
only
2883
100n
2868
100n
MP894
system ground
<--- to Mainboard 3CDC

NOT ON ALL VE

Circuit diagram Connector Board

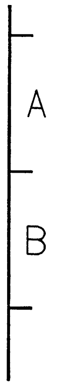
1806	A3	1860	E8	1874	B8	2883	C4
1808	D8	1873	D8	2868	C5		

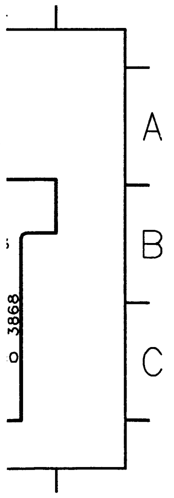

1 2 3 4 5 6 7 8 9 10
A B C D E
1806
OE_LATCH
PORE
GND
SILD
DATA
SICL
SHR_CL
STR_OUT
SW_INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DQSY
SRDT
GND
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Basic version
Digital Out or Kill/Iref
For CD_Text version only
<--- to Mainboard 3CDC
for prov. only
2883 100n
MP894
system ground
2868 100n
SXXB-EH-A
9 OE_LATCH
8 SICL
7 GND
6 SILD
5 DATA
4 PORE
3 SHR_CL
2 STR_OUT
1 SW_INFO
1874
to frontboard of set
SXXB-EH-A
6 +10V
5 GND
4 +5V
3 RIGHT
2 GNDA
1 LEFT
1873
to A/F board of set
PH-S
1808
1 SHIELDING/KILLL/EBUGND
2 COAX2/KILLR/EBUOUT
3 COAX1/IREF/+5V
FFC
1860
1 uP_CLK
2 GND
3 SRDT
4 DQSY
to frontboard

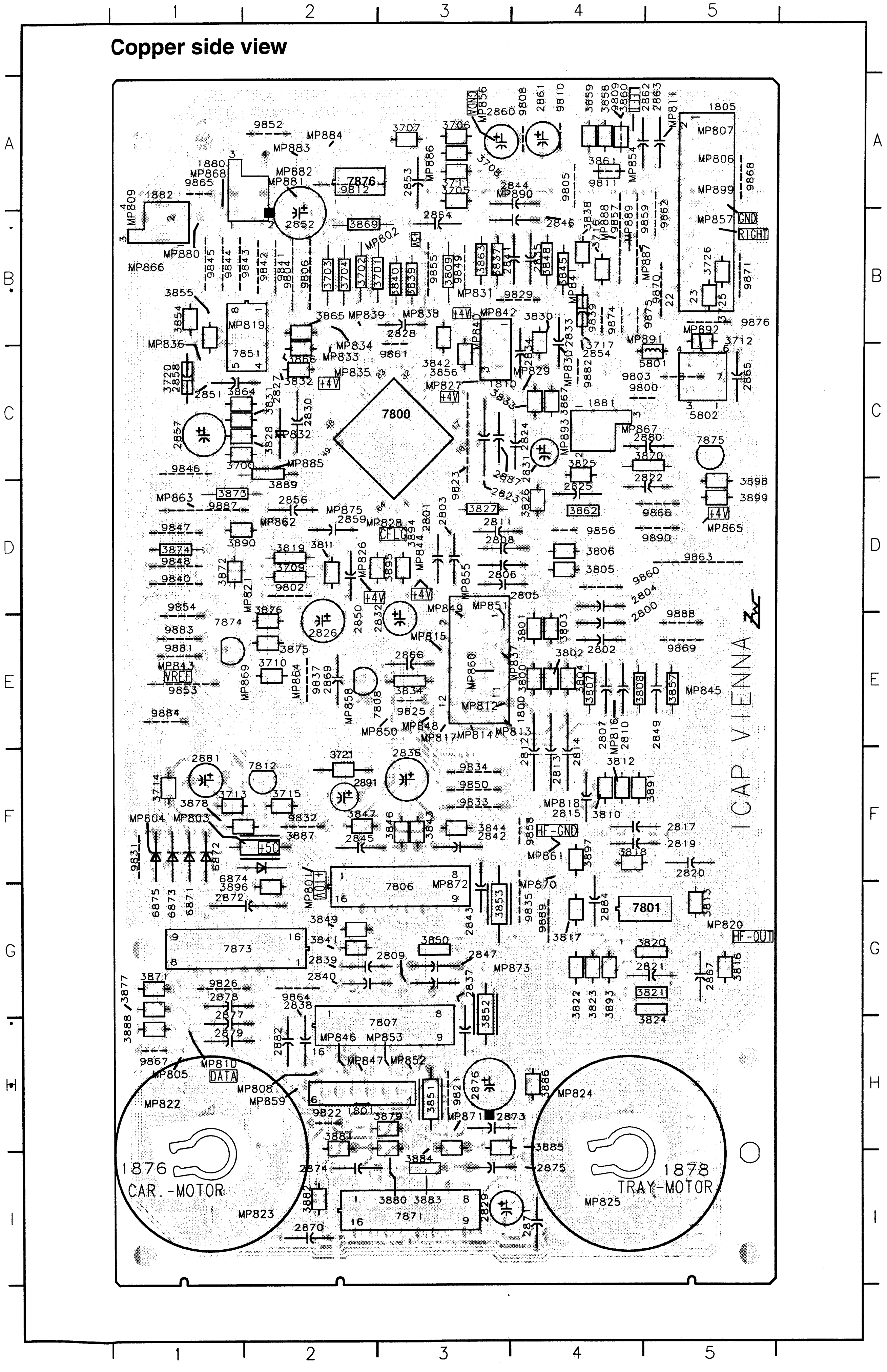
NOT ON ALL VERSIONS

ical out

1850	C2
2890	C1
3868	C2
7810	B1



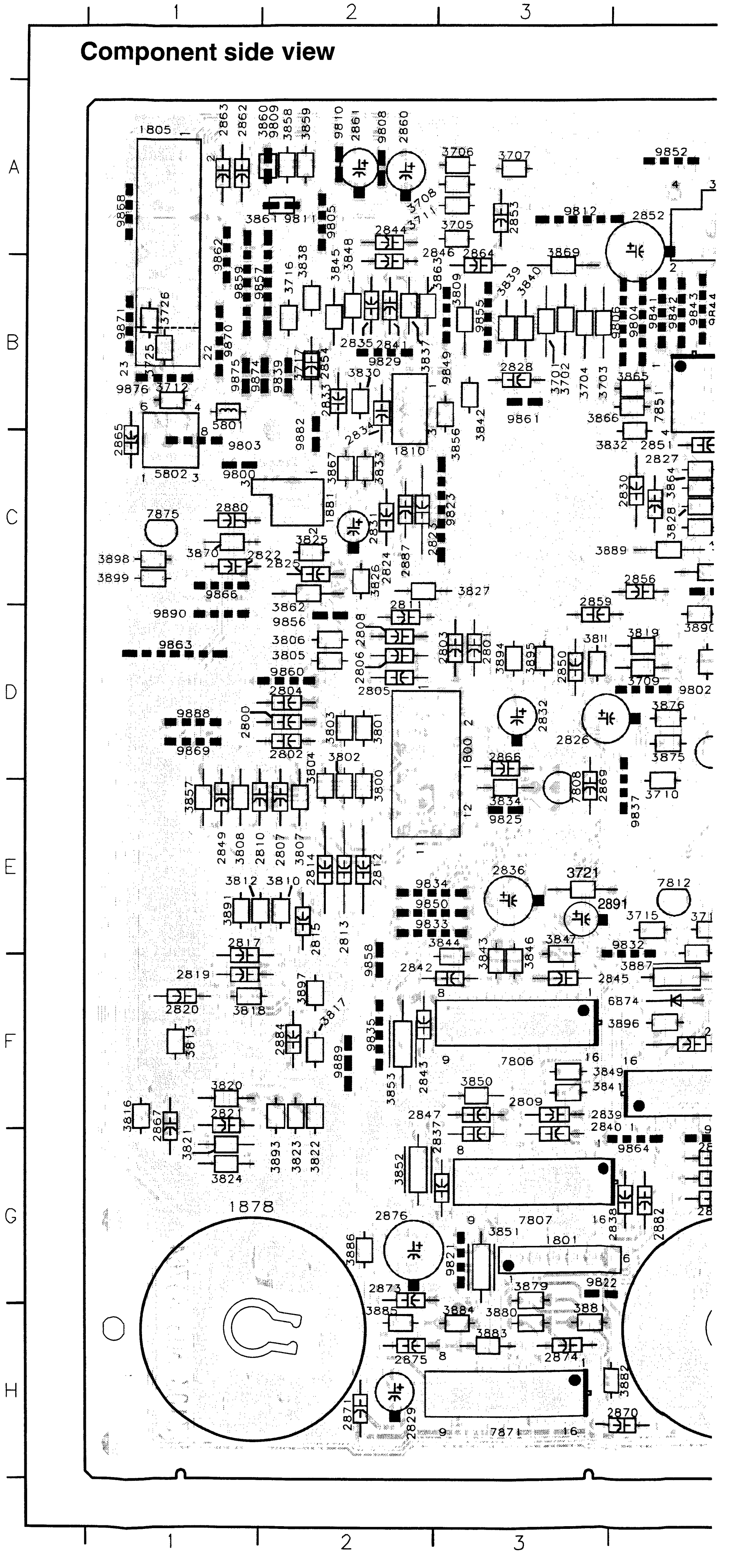




Copper side view

1
2
3
4
5
A
B
C
D
E
F
G
H
I
7800
7801
7806
7807
7871
7873
7876
7851
1876
CAR.-MOTOR
1878
TRAY-MOTOR
ICAP-VIENNA
1805
1810
1880
1881
1882
1801
RIGHT
GND
HF-GND
HF-OUT
DATA
VREF
CFLG
+4V
+5C

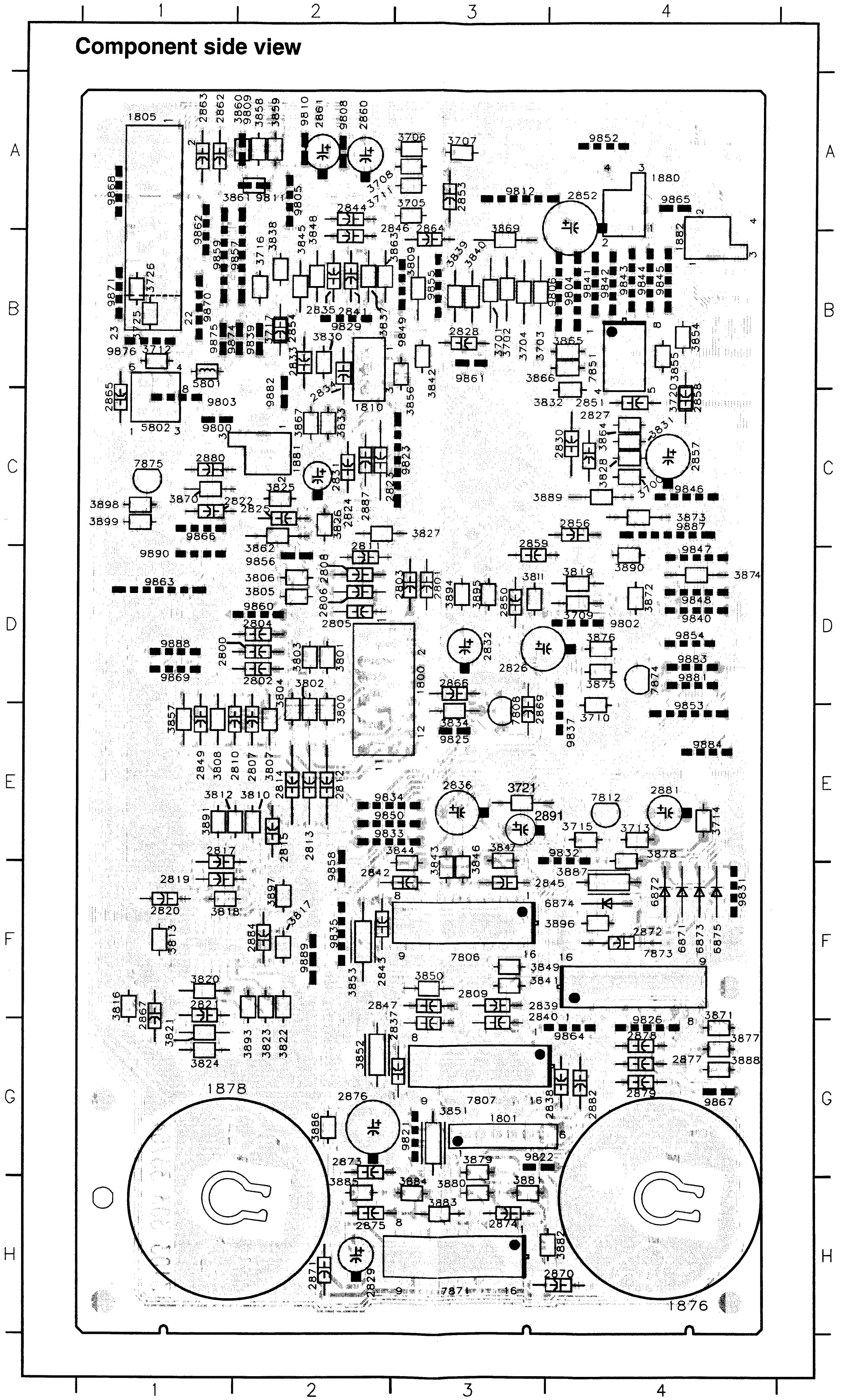
1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3869	B2	9841	B2
2821	G5	3712	B5	3870	C5	9842	B2
2822	D5	3713	F1	3871	G1	9843	B2
2823	C3	3714	F1	3872	D1	9844	B1
2824	C4	3715	F2	3873	D1	9845	B1
2825	D4	3716	B4	3874	D1	9846	C1
2826	D2	3717	B4	3875	E2	9847	D1
2827	C2	3720	C1	3876	E2	9848	D1
2828	B3	3725	B5	3877	G1	9849	B3
2829	I3	3726	B5	3878	F2	9850	F3
2830	C2	3800	E4	3879	H3	9852	A2
2831	C4	3801	E4	3880	H3	9853	E1
2832	E3	3802	E4	3881	H2	9854	D1
2833	B4	3803	E4	3882	I2	9855	B3
2834	C3	3804	E4	3883	I3	9856	D4
2835	B4	3805	D4	3884	H3	9857	B4
2836	F3	3806	D4	3885	H3	9858	F4
2837	H3	3807	E4	3886	H4	9859	B4
2838	H2	3808	E4	3887	F2	9860	D4
2839	G2	3809	B3	3888	H1	9861	B3
2840	G2	3810	F4	3889	C2	9862	B5
2841	B3	3811	D2	3890	D1	9863	D5
2842	F3	3812	F4	3891	F4	9864	G2
2843	G3	3813	G5	3893	G4	9865	A1
2844	B4	3816	G5	3894	D3	9866	D5
2845	F2	3817	G4	3895	D3	9867	H1
2846	B4	3818	F4	3896	G2	9868	A5
2847	G3	3819	D2	3897	F4	9869	E5
2849	E5	3820	G5	3898	D5	9870	B5
2850	D2	3821	G5	3899	D5	9871	B5
2851	C1	3822	G4	5801	B5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		



Component side view

1
2
3
A
B
C
D
E
F
G
H
1805
1810
1800
1801
1878
1881
7806
7807
7871
7851
7812
5801
5802

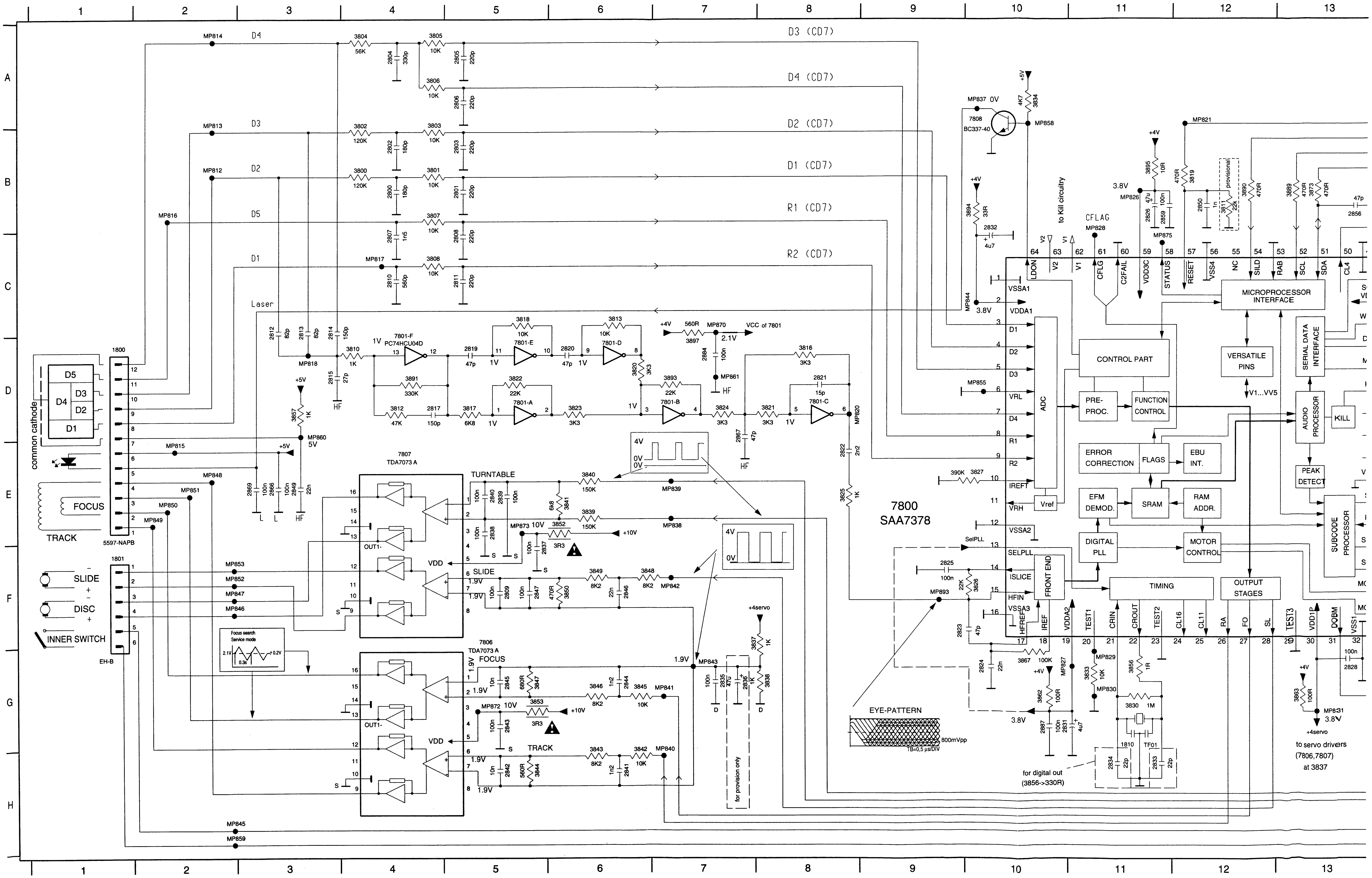
1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3869	B2	9841	B2
2821	G5	3712	B5	3870	C5	9842	B2
2822	D5	3713	F1	3871	G1	9843	B2
2823	C3	3714	F1	3872	D1	9844	B1
2824	C4	3715	F2	3873	D1	9845	B1
2825	D4	3716	B4	3874	D1	9846	C1
2826	D2	3717	B4	3875	E2	9847	D1
2827	C2	3720	C1	3876	E2	9848	D1
2828	B3	3725	B5	3877	G1	9849	B3
2829	I3	3726	B5	3878	F2	9850	F3
2830	C2	3800	E4	3879	H3	9852	A2
2831	C4	3801	E4	3880	H3	9853	E1
2832	E3	3802	E4	3881	H2	9854	D1
2833	B4	3803	E4	3882	I2	9855	B3
2834	C3	3804	E4	3883	I3	9856	D4
2835	B4	3805	D4	3884	H3	9857	B4
2836	F3	3806	D4	3885	H3	9858	F4
2837	H3	3807	E4	3886	H4	9859	B4
2838	H2	3808	E4	3887	F2	9860	D4
2839	G2	3809	B3	3888	H1	9861	B3
2840	G2	3810	F4	3889	C2	9862	B5
2841	B3	3811	D2	3890	D1	9863	D5
2842	F3	3812	F4	3891	F4	9864	G2
2843	G3	3813	G5	3893	G4	9865	A1
2844	B4	3816	G5	3894	D3	9866	D5
2845	F2	3817	G4	3895	D3	9867	H1
2846	B4	3818	F4	3896	G2	9868	A5
2847	G3	3819	D2	3897	F4	9869	E5
2849	E5	3820	G5	3898	D5	9870	B5
2850	D2	3821	G5	3899	D5	9871	B5
2851	C1	3822	G4	5801	B5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		

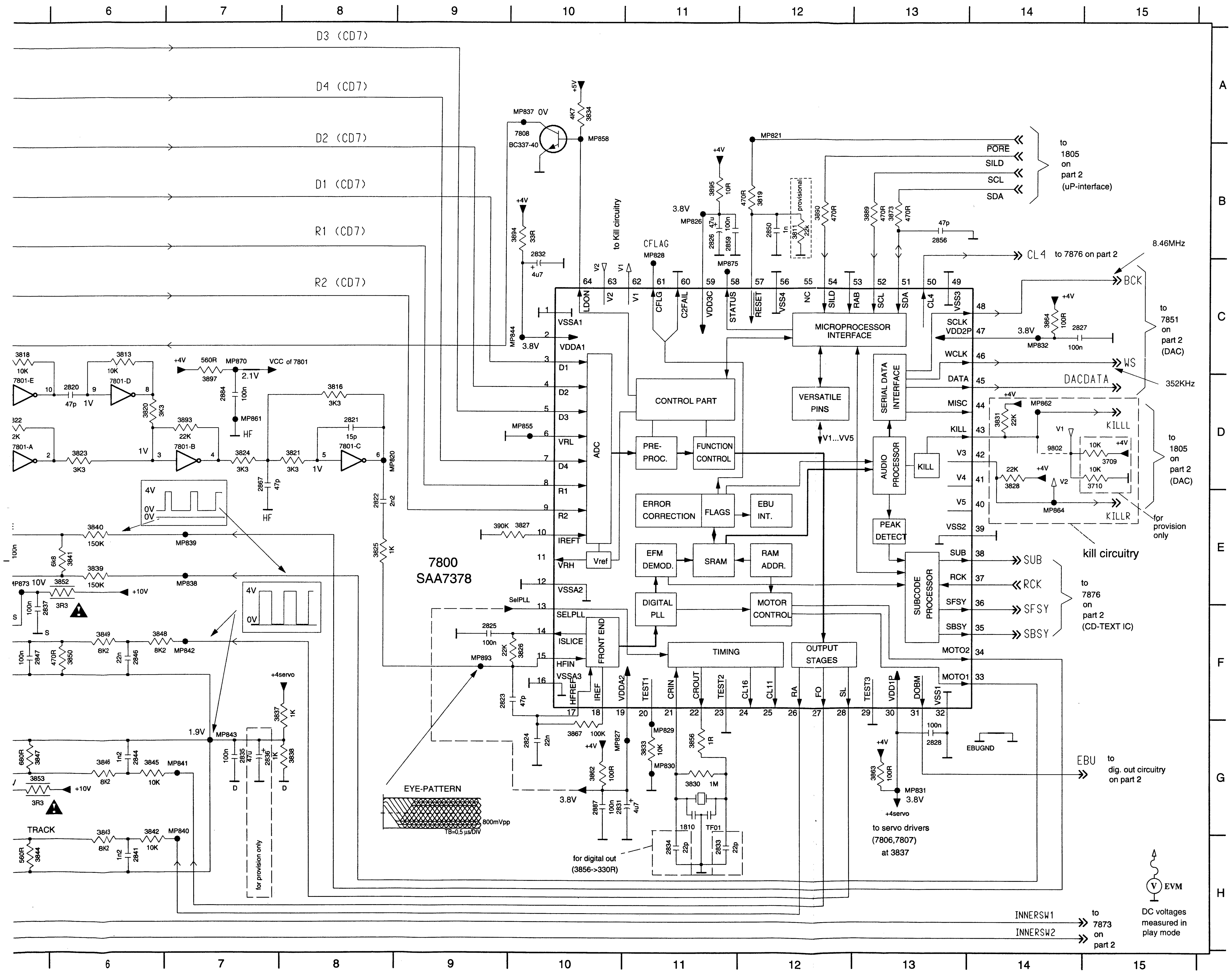


Component side view

1800	D3	2869	E3	3841	F3	9800	C1
1801	G3	2870	H4	3842	B3	9802	D4
1805	A1	2871	H2	3843	F3	9803	C1
1810	B2	2872	F4	3844	F3	9804	B4
1876	H4	2873	G2	3845	B2	9805	A2
1878	H1	2874	H3	3846	F3	9806	B4
1880	B4	2875	H2	3847	E3	9808	A2
1881	C2	2876	G3	3848	B2	9809	A2
1882	B4	2877	G4	3849	F3	9810	A2
2800	D2	2878	G4	3850	F3	9811	A2
2801	D3	2879	G4	3851	G3	9812	A3
2802	D2	2880	C1	3852	G2	9821	G3
2803	D3	2881	E4	3853	F2	9822	G3
2804	D2	2882	G4	3854	B4	9823	C3
2805	D2	2884	F2	3855	B4	9825	E3
2806	D2	2887	C2	3856	B3	9826	G4
2807	E2	3700	C4	3857	E1	9829	B2
2808	D2	3701	B3	3858	A2	9831	F4
2809	F3	3702	B3	3859	A2	9832	E4
2810	E2	3703	B3	3860	A2	9833	E2
2811	D2	3704	B3	3861	A2	9834	E2
2812	E2	3705	A3	3862	C2	9835	F2
2813	E2	3706	A3	3863	B2	9837	E4
2814	E2	3707	A3	3864	C4	9839	B2
2815	E2	3708	A3	3865	B4	9840	D4
2817	F1	3709	D4	3866	B4	9841	B4
2819	F1	3710	E4	3867	C2	9842	B4
2820	F1	3711	A3	3869	B3	9843	B4
2821	G1	3712	B1	3870	C1	9844	B4
2822	C1	3713	E4	3871	G4	9845	B4
2823	C2	3714	E4	3872	D4	9846	C4
2824	C2	3715	E4	3873	C4	9847	D4
2825	C2	3716	B2	3874	D4	9848	D4
2826	D3	3717	B2	3875	D4	9849	B3
2827	C4	3720	C4	3876	D4	9850	E2
2828	B3	3725	B1	3877	G4	9852	A4
2829	H2	3726	B1	3878	E4	9853	E4
2830	C4	3800	E2	3879	G3	9854	D4
2831	C2	3801	D2	3880	H3	9855	B3
2832	D3	3802	E2	3881	H3	9856	D2
2833	B2	3803	D2	3882	H4	9857	B2
2834	B2	3804	E2	3883	H3	9858	F2
2835	B2	3805	D2	3884	H3	9859	B1
2836	E3	3806	D2	3885	H2	9860	D2
2837	G2	3807	E2	3886	G2	9861	B3
2838	G4	3808	E1	3887	F4	9862	A1
2839	F3	3809	B3	3888	G4	9863	D1
2840	F3	3810	E2	3889	C4	9864	G4
2841	B2	3811	D3	3890	D4	9865	A4
2842	F3	3812	E2	3891	E1	9866	C1
2843	F2	3813	F1	3893	F2	9867	G4
2844	B2	3816	F1	3894	D3	9868	A1
2845	F3	3817	F2	3895	D3	9869	D1
2846	B2	3818	F1	3896	F4	9870	B1
2847	F3	3819	D4	3897	F2	9871	B1
2849	E1	3820	F1	3898	C1	9874	B2
2850	D3	3821	G1	3899	C1	9875	B1
2851	C4	3822	F2	5801	B1	9876	B1
2852	A4	3823	F2	5802	C1	9881	D4
2853	A3	3824	G1	6871	F4	9882	C2
2854	B2	3825	C2	6872	F4	9883	D4
2856	C4	3826	C2	6873	F4	9884	E4
2857	C4	3827	C2	6874	F4	9887	C4
2858	C4	3828	C4	6875	F4	9888	D1
2859	C3	3830	B2	7806	F3	9889	F2
2860	A2	3831	C4	7807	G3	9890	D1
2861	A2	3832	C4	7808	E3		
2862	A1	3833	C2	7812	E4		
2863	A1	3834	E3	7851	B4		
2864	B3	3837	B2	7871	H3		
2865	C1	3838	B2	7873	F4		
2866	E3	3839	B3	7874	D4		
2867	F1	3840	B3	7875	C1		

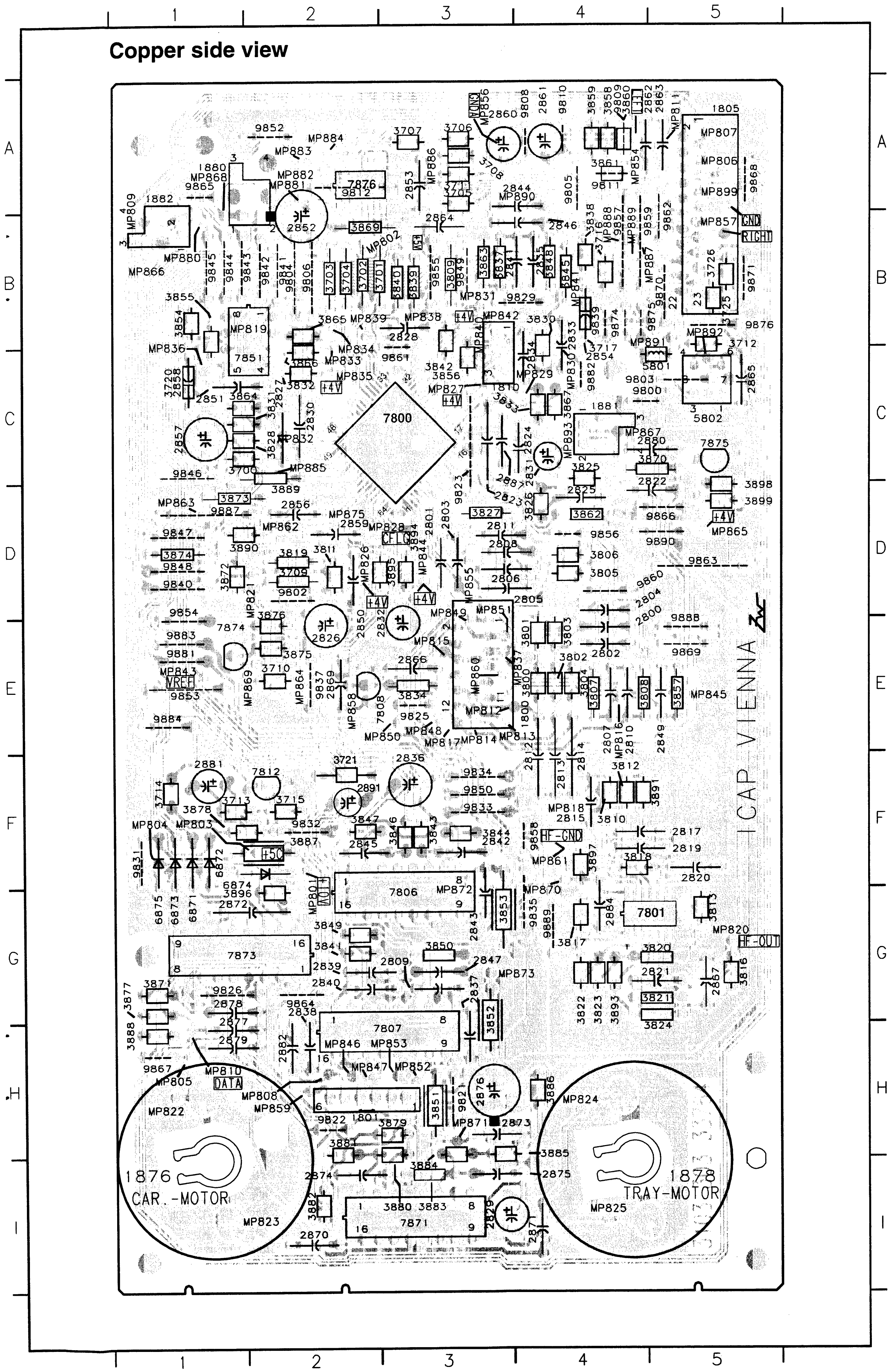
Circuit Diagram Main Board part1


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
MP814
D4
MP813
D3
MP812
D2
MP816
D5
D1
Laser
3804
56K
3805
10K
2804
330p
2805
220p
3806
10K
2806
220p
3802
120K
3803
10K
2802
180p
2803
220p
3800
120K
3801
10K
2800
180p
2801
220p
3807
10K
2807
1n5
2808
220p
MP817
3808
10K
2810
560p
2811
220p
D3 (CD7)
D4 (CD7)
D2 (CD7)
D1 (CD7)
R1 (CD7)
R2 (CD7)
1800
5597-NAPB
D5
D4
D3
D2
D1
common cathode
FOCUS
TRACK
MP815
+5V
MP848
MP851
MP850
MP849
2812
82p
2813
82p
2814
150p
MP818
2815
27p
HF
+5V
3857
1K
MP860
5V
2869
100n
2866
100n
2849
22n
L
L
HF
1V
7801-F
PC74HCU04D
3810
1K
2819
47p
3818
10K
7801-E
1V
2820
47p
3813
10K
7801-D
1V
3820
3K3
3891
330K
3822
22K
7801-A
3812
47K
2817
150p
3817
6K8
1V
3823
3K3
3893
22K
7801-B
1V
+4V
560R
3897
MP870
2.1V
VCC of 7801
2884
100n
MP861
HF
3816
3K3
2821
15p
7801-C
3824
3K3
3821
3K3
1V
MP820
2867
47p
HF
2822
2n2
3825
1K
4V
0V
0V
4V
0V
7807
TDA7073 A
TURNTABLE
2840
100n
2839
100n
3841
6K8
3840
150K
MP839
3839
150K
MP838
2838
100n
MP873
10V
3852
3R3
+10V
2837
100n
S
S
S
OUT1-
VDD
SLIDE
1.9V
1.9V
2809
100n
2847
100n
3850
470R
3849
8K2
2846
22n
3848
8K2
MP842
1801
EH-B
SLIDE
DISC
INNER SWITCH
MP853
MP852
MP847
MP846
Focus search
Service mode
2.1V
0.3s
+0.2V
7806
TDA7073 A
FOCUS
1.9V
2845
10n
3847
560R
1.9V
MP843
3846
8K2
2844
1n2
3845
10K
MP841
MP872
10V
3853
3R3
+10V
2843
100n
TRACK
1.9V
2842
10n
3844
560R
3843
8K2
2841
1n2
3842
10K
MP840
1.9V
2835
100n
2836
47u
for provision only
+4servo
3837
1K
3838
1K
D
D
MP845
MP859
MP837
0V
7808
BC337-40
+5V
3834
4K7
MP858
+4V
3894
33R
2832
4u7
MP844
3.8V
to Kill circuitry
V2
V1
CFLAG
MP828
3.8V
MP826
+4V
3895
10R
2826
47u
2859
100n
MP875
3819
470R
MP821
2850
1n
3811
22k
provisional
3890
470R
3889
470R
3873
470R
47p
2856
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
LDON
V2
V1
CFLG
C2FAIL
VDD3C
STATUS
RESET
VSS4
NC
SILD
RAB
SCL
SDA
CL4
VSSA1
VDDA1
D1
D2
D3
VRL
D4
R1
R2
IREFT
VRH
VSSA2
SELPLL
ISLICE
HFIN
VSSA3
HFREF
IREF
VDDA2
TEST1
CRIN
CROUT
TEST2
CL16
CL11
RA
FO
SL
TEST3
VDD1P
DOBM
VSS1
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
MP855
390K
3827
SelPLL
2825
100n
MP893
3826
22K
2823
47p
2824
22n
ADC
Vref
FRONT END
CONTROL PART
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
TIMING
OUTPUT STAGES
MICROPROCESSOR INTERFACE
VERSATILE PINS
V1...VV5
SERIAL DATA INTERFACE
AUDIO PROCESSOR
KILL
PEAK DETECT
SUBCODE PROCESSOR
7800
SAA7378
3867
100K
+4V
MP827
3833
10K
MP829
3856
1R
3862
100R
MP830
3830
1M
3.8V
2887
100n
2831
4u7
1810
TF01
2834
22p
2833
22p
for digital out
(3856->330R)
EYE-PATTERN
800mVpp
TB=0,5 µs/DIV
+4V
3863
100R
MP831
3.8V
+4servo
100n
2828
to servo drivers
(7806,7807)
at 3837



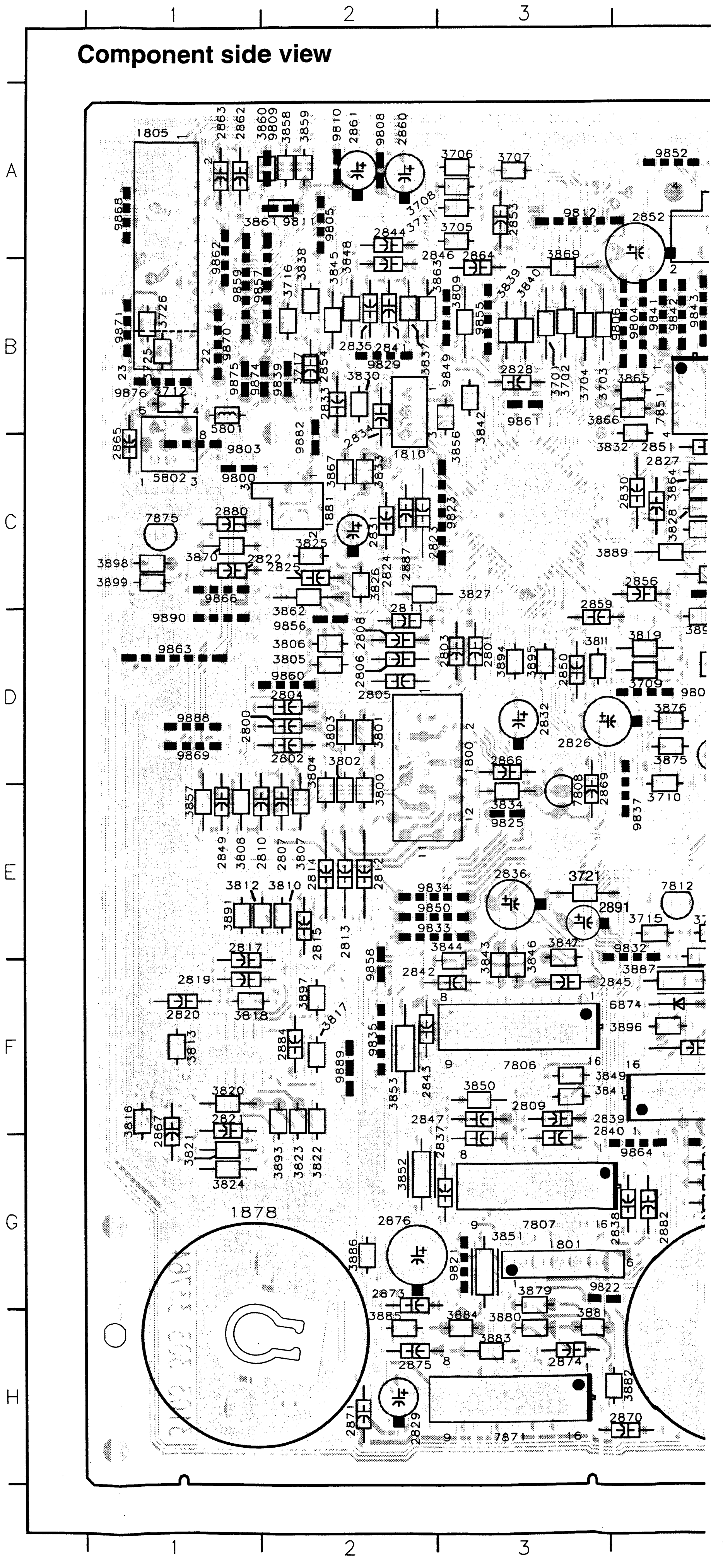
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
D3 (CD7)
D4 (CD7)
D2 (CD7)
D1 (CD7)
R1 (CD7)
R2 (CD7)
7800
SAA7378
ADC
CONTROL PART
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
MICROPROCESSOR INTERFACE
VERSATILE PINS
V1...VV5
SERIAL DATA INTERFACE
AUDIO PROCESSOR
KILL
PEAK DETECT
SUBCODE PROCESSOR
Vref
VSSA1
VDDA1
VRL
IREFT
VRH
VSSA2
SELPLL
ISLICE
HFIN
VSSA3
HFREF
IREF
VDDA2
TEST1
CRIN
CROUT
TEST2
CL16
CL11
RA
FO
SL
TEST3
VDD1P
DOBM
VSS1
LDON
V2
V1
CFLG
C2FAIL
VDD3C
STATUS
RESET
VSS4
NC
SILD
RAB
SCL
SDA
CL4
VSS3
SCLK
VDD2P
WCLK
DATA
MISC
KILL
V3
V4
V5
VSS2
SUB
RCK
SFSY
SBSY
MOTO2
MOTO1
PORE
SILD
SCL
SDA
to 1805 on part 2 (uP-interface)
CL4 to 7876 on part 2
8.46MHz
BCK
WS
DACDATA
to 7851 on part 2 (DAC)
352KHz
KILLL
KILLR
to 1805 on part 2 (DAC)
for provision only
kill circuitry
SUB
RCK
SFSY
SBSY
to 7876 on part 2 (CD-TEXT IC)
EBU
to dig. out circuitry on part 2
EBUGND
to servo drivers (7806,7807) at 3837
INNERSW1
INNERSW2
to 7873 on part 2
DC voltages measured in play mode
EVM
to Kill circuitry
CFLAG
MP828
MP837 0V
7808
BC337-40
MP858
+5V
3834 4K7
MP844
3.8V
3894 33R
2832 4u7
+4V
MP826
2826 47u
2859 100n
MP875
3895 10R
MP821
3819 470R
2850 1n
3811 22k
provisional
3890 470R
3889 470R
3873 470R
2856 47p
3864 100R
2827 100n
MP832
MP862
3831 22K
9802
3709 10K
3710 10K
3828 22K
MP864
VCC of 7801
3897 560R
MP870
2.1V
2884 100n
MP861
HF
3818 10K
3813 10K
7801-E
7801-D
2820 47p
1V
3820 3K3
3893 22K
7801-A
7801-B
7801-C
3823 3K3
3824 3K3
3821 3K3
3816 3K3
2821 15p
MP820
2867 47p
2822 2n2
3825 1K
MP855
3827 390K
4V
0V
3840 150K
MP839
3841 6k8
3839 150K
MP838
MP873 10V
3852 3R3
+10V
2837 100n
3849 8K2
3848 8K2
MP842
2847 100n
3850 470R
2846 22n
2825 100n
3826 22K
SelPLL
MP893
2823 47p
2824 22n
3867 100K
MP827
3862 100R
2887 100n
2831 4u7
MP829
3833 10K
MP830
3856 1R
3830 1M
1810
TF01
2834 22p
2833 22p
for digital out (3856->330R)
EYE-PATTERN
800mVpp
TB=0,5 µs/DIV
2828 100n
3863 100R
MP831
+4servo
1.9V
MP843
2835 470
2836 1K
3837 1K
3838
3847 560R
3846 8K2
2844 1n2
3845 10K
MP841
3853 3R3
+10V
TRACK
3843 8K2
2841 1n2
3842 10K
MP840
3844 560R
for provision only

1800	D1
1801	F1
1810	G11
2800	B4
2801	B5
2802	B4
2803	B5
2804	A4
2805	A5
2806	A5
2807	C4
2808	C5
2809	F5
2810	C4
2811	C5
2812	C3
2813	C3
2814	C3
2815	D3
2817	D4
2819	D5
2820	D6
2821	D8
2822	E8
2823	F9
2824	G9
2825	F9
2826	B11
2827	C14
2828	G13
2831	G10
2832	B10
2833	H11
2834	H11
2835	G7
2836	G7
2837	F5
2838	E5
2839	E5
2840	E5
2841	H6
2842	H5
2843	G5
2844	G6
2845	G5
2846	F6
2847	F5
2849	E3
2850	B12
2856	B13
2859	B11
2866	E3
2867	D7
2869	E3
2884	D7
2887	G10
3709	D15
3710	D15
3800	B4
3801	B4
3802	A4
3803	A4
3804	A4
3805	A4
3806	A4
3807	B4
3808	C4
3810	D4
3811	B12
3812	D4
3813	C6
3816	D8
3817	D5
3818	C5
3819	B12
3820	D6
3821	D8
3822	D5
3823	D6
3824	D7
3825	E8
3826	F10
3827	E10
3828	D14
3830	G11
3831	D14
3833	G11
3834	B10
3837	F8
3838	G8
3839	E6
3840	E6
3841	E6
3842	G6
3843	G6
3844	H5
3845	G6
3846	G6
3847	G5
3848	F6
3849	F6
3850	F6
3852	E6
3853	G5
3856	G11
3857	D3
3862	G10
3863	G13
3864	C14
3867	G10
3873	B13
3889	B13
3890	B12
3891	D4
3893	D7
3894	B10
3895	B11
3897	D7
7800	E9
7801-A	D5
7801-B	D7
7801-C	D8
7801-D	D6
7801-E	D5
7801-F	D4
7806	G5
7807	E4
7808	B10
9802	D14
MP812	B2
MP813	A2
MP814	A2
MP815	E2
MP816	B2
MP817	C4
MP818	D3
MP820	D8
MP821	B12
MP826	B11
MP827	G10
MP828	B11
MP829	G11
MP830	G11
MP831	G13
MP832	C14
MP837	B10
MP838	E6
MP839	E6
MP840	G7
MP841	G7
MP842	F7
MP843	G7
MP844	C10
MP845	H3
MP846	F2
MP847	F2
MP848	E2
MP849	E2
MP850	E2
MP851	E2
MP852	F2
MP853	F2
MP855	D10
MP858	B10
MP859	H3
MP860	D3
MP861	D7
MP862	D14
MP864	E14
MP870	C7
MP872	G5
MP873	E5
MP875	C11
MP893	F9

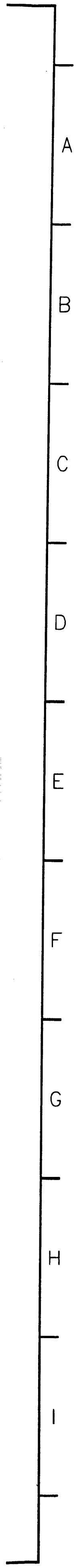


Copper side view

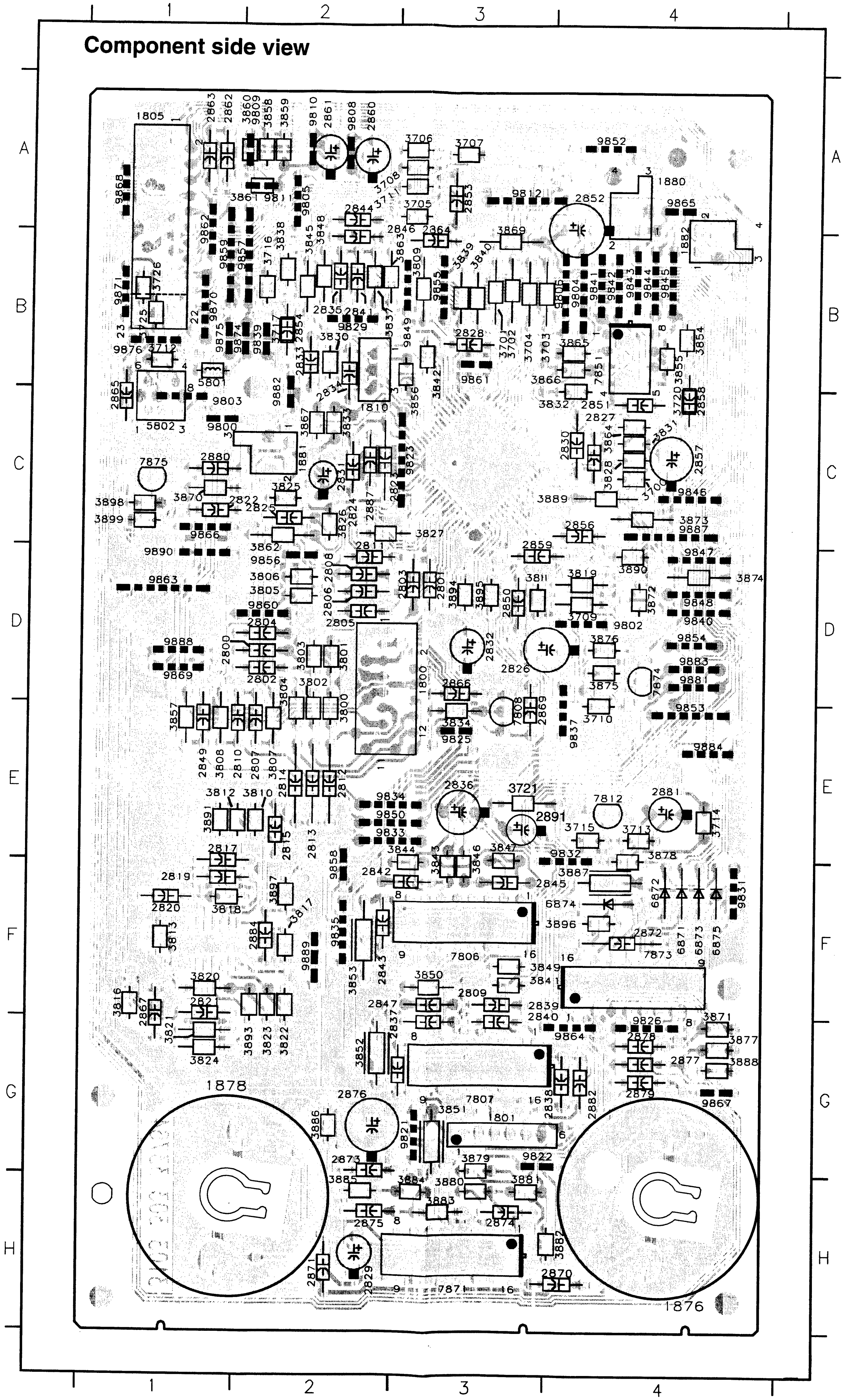
1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3869	B2	9841	B2
2821	G5	3712	B5	3870	C5	9842	B2
2822	D5	3713	F1	3871	G1	9843	B2
2823	C3	3714	F1	3872	D1	9844	B1
2824	C4	3715	F2	3873	D1	9845	B1
2825	D4	3716	B4	3874	D1	9846	C1
2826	D2	3717	B4	3875	E2	9847	D1
2827	C2	3720	C1	3876	E2	9848	D1
2828	B3	3725	B5	3877	G1	9849	B3
2829	I3	3726	B5	3878	F2	9850	F3
2830	C2	3800	E4	3879	H3	9852	A2
2831	C4	3801	E4	3880	H3	9853	E1
2832	E3	3802	E4	3881	H2	9854	D1
2833	B4	3803	E4	3882	I2	9855	B3
2834	C3	3804	E4	3883	I3	9856	D4
2835	B4	3805	D4	3884	H3	9857	B4
2836	F3	3806	D4	3885	H3	9858	F4
2837	H3	3807	E4	3886	H4	9859	B4
2838	H2	3808	E4	3887	F2	9860	D4
2839	G2	3809	B3	3888	H1	9861	B3
2840	G2	3810	F4	3889	C2	9862	B5
2841	B3	3811	D2	3890	D1	9863	D5
2842	F3	3812	F4	3891	F4	9864	G2
2843	G3	3813	G5	3893	G4	9865	A1
2844	B4	3816	G5	3894	D3	9866	D5
2845	F2	3817	G4	3895	D3	9867	H1
2846	B4	3818	F4	3896	G2	9868	A5
2847	G3	3819	D2	3897	F4	9869	E5
2849	E5	3820	G5	3898	D5	9870	B5
2850	D2	3821	G5	3899	D5	9871	B5
2851	C1	3822	G4	5801	B5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		



Component side view

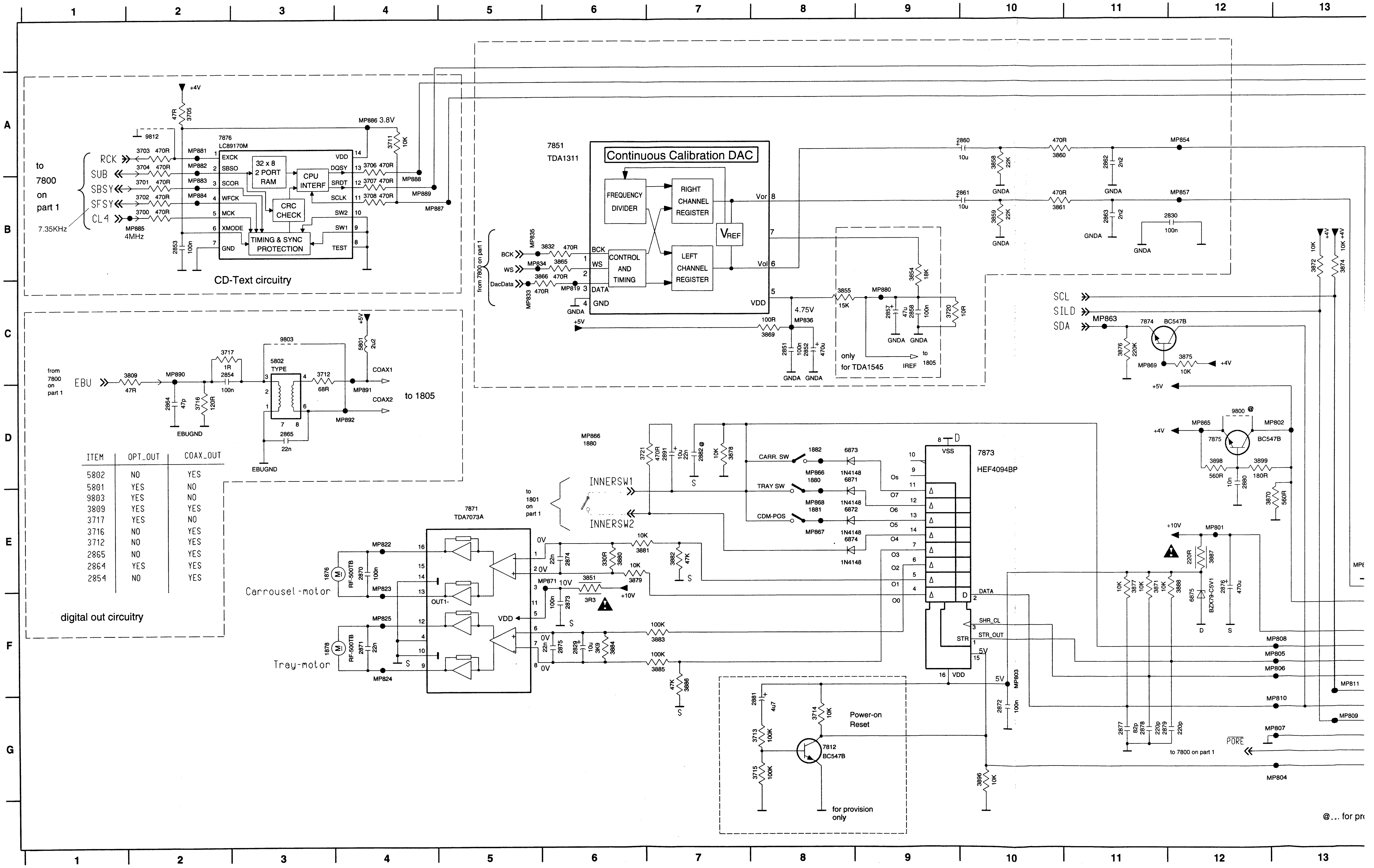


1800	E3
1801	H2
1805	B5
1810	C3
1876	I1
1878	I4
1880	B2
1881	C4
1882	B1
2800	D4
2801	D3
2802	E4
2803	D3
2804	D4
2805	D3
2806	D3
2807	E4
2808	D3
2809	G3
2810	E4
2811	D3
2812	F4
2813	F4
2814	F4
2815	F4
2817	F4
2819	F4
2820	F5
2821	G5
2822	D5
2823	C3
2824	C4
2825	D4
2826	D2
2827	C2
2828	B3
2829	I3
2830	C2
2831	C4
2832	E3
2833	B4
2834	C3
2835	B4
2836	F3
2837	H3
2838	H2
2839	G2
2840	G2
2841	B3
2842	F3
2843	G3
2844	B4
2845	F2
2846	B4
2847	G3
2849	E5
2850	D2
2851	C1
2852	A2
2853	A3
2854	B4
2856	D2
2857	C1
2858	C1
2859	D2
2860	A3
2861	A4
2862	A4
2863	A5
2864	B3
2865	C5
2866	E3
2867	G5
2869	E2
2870	I2
2871	I4
2872	G2
2873	H3
2874	I2
2875	I3
2876	H3
2877	G1
2878	G1
2879	H1
2880	C5
2881	F1
2882	H2
2884	G4
2887	C3
3700	C1
3701	B3
3702	B2
3703	B2
3704	B2
3705	A3
3706	A3
3707	A3
3708	A3
3709	D2
3710	E2
3711	A3
3712	B5
3713	F1
3714	F1
3715	F2
3716	B4
3717	B4
3720	C1
3725	B5
3726	B5
3800	E4
3801	E4
3802	E4
3803	E4
3804	E4
3805	D4
3806	D4
3807	E4
3808	E4
3809	B3
3810	F4
3811	D2
3812	F4
3813	G5
3816	G5
3817	G4
3818	F4
3819	D2
3820	G5
3821	G5
3822	G4
3823	G4
3824	G5
3825	C4
3826	D4
3827	D3
3828	C1
3830	B4
3831	C1
3832	C2
3833	C4
3834	E3
3837	B3
3838	B4
3839	B3
3840	B3
3841	G2
3842	B3
3843	F3
3844	F3
3845	B4
3846	F3
3847	F2
3848	B4
3849	G2
3850	G3
3851	H3
3852	G3
3853	G3
3854	B1
3855	B1
3856	C3
3857	E5
3858	A4
3859	A4
3860	A4
3861	A4
3862	D4
3863	B3
3864	C1
3865	B2
3866	C2
3867	C4
3869	B2
3870	C5
3871	G1
3872	D1
3873	D1
3874	D1
3875	E2
3876	E2
3877	G1
3878	F2
3879	H3
3880	H3
3881	H2
3882	I2
3883	I3
3884	H3
3885	H3
3886	H4
3887	F2
3888	H1
3889	C2
3890	D1
3891	F4
3893	G4
3894	D3
3895	D3
3896	G2
3897	F4
3898	D5
3899	D5
5801	B5
5802	C5
6871	F1
6872	F1
6873	F1
6874	F2
6875	F1
7800	C2
7801	G4
7806	G3
7807	H3
7808	E2
7812	F2
7851	B2
7871	I3
7873	G1
7874	E1
7875	C5
9800	C4
9802	D2
9803	C5
9804	B2
9805	A4
9806	B2
9808	A4
9809	A4
9810	A4
9811	A4
9812	A2
9821	H3
9822	H2
9823	C3
9825	E3
9826	G1
9829	B4
9831	F1
9832	F2
9833	F3
9834	F3
9835	G4
9837	E2
9839	B4
9840	D1
9841	B2
9842	B2
9843	B2
9844	B1
9845	B1
9846	C1
9847	D1
9848	D1
9849	B3
9850	F3
9852	A2
9853	E1
9854	D1
9855	B3
9856	D4
9857	B4
9858	F4
9859	B4
9860	D4
9861	B3
9862	B5
9863	D5
9864	G2
9865	A1
9866	D5
9867	H1
9868	A5
9869	E5
9870	B5
9871	B5
9874	B4
9875	B4
9876	B5
9881	E1
9882	C4
9883	E1
9884	E1
9887	D1
9888	E5
9889	G4
9890	D5



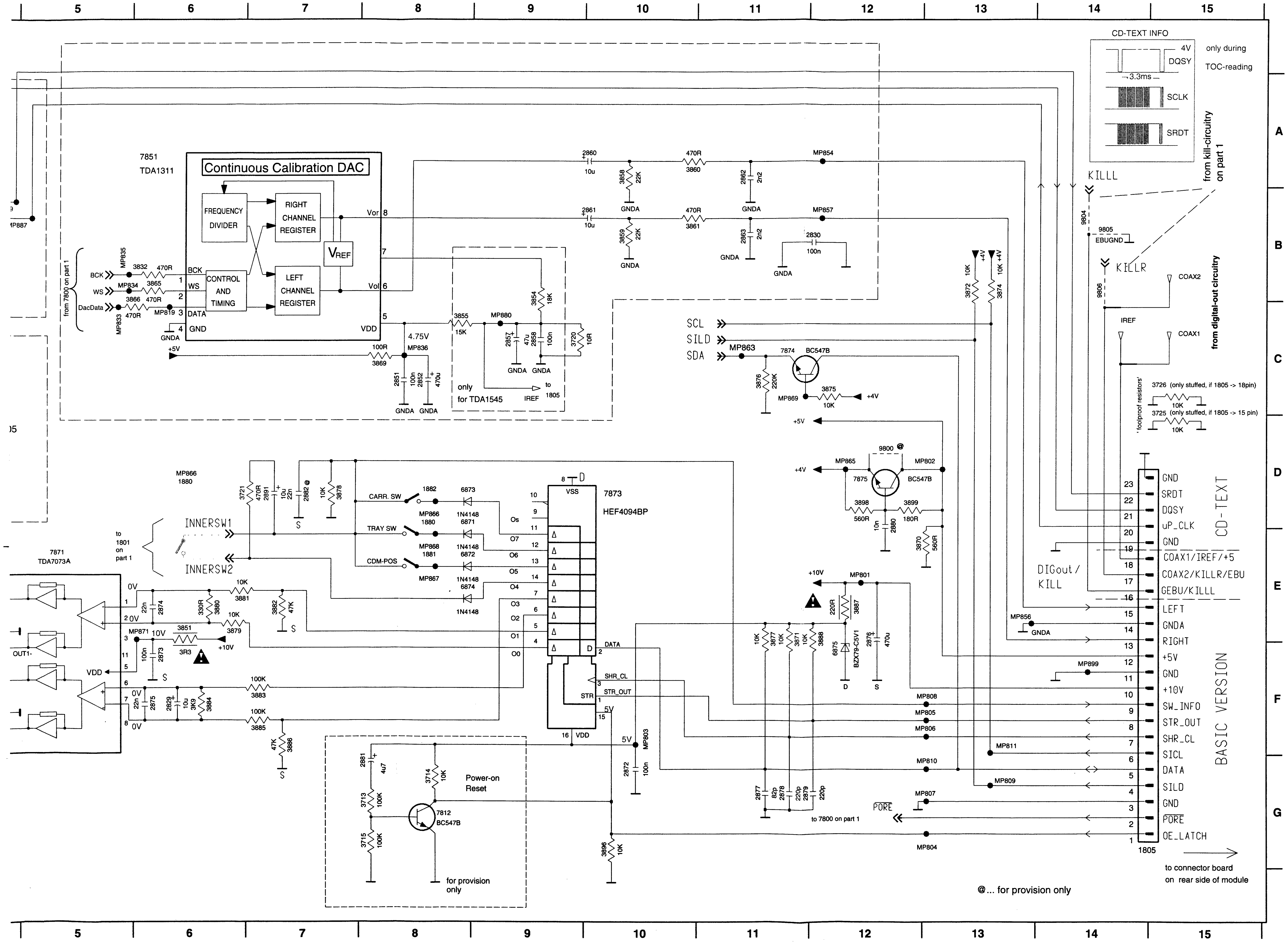
1800	D3
1801	G3
1805	A1
1810	B2
1876	H4
1878	H1
1880	B4
1881	C2
1882	B4
2800	D2
2801	D3
2802	D2
2803	D3
2804	D2
2805	D2
2806	D2
2807	E2
2808	D2
2809	F3
2810	E2
2811	D2
2812	E2
2813	E2
2814	E2
2815	E2
2817	F1
2819	F1
2820	F1
2821	G1
2822	C1
2823	C2
2824	C2
2825	C2
2826	D3
2827	C4
2828	B3
2829	H2
2830	C4
2831	C2
2832	D3
2833	B2
2834	B2
2835	B2
2836	E3
2837	G2
2838	G4
2839	F3
2840	F3
2841	B2
2842	F3
2843	F2
2844	B2
2845	F3
2846	B2
2847	F3
2849	E1
2850	D3
2851	C4
2852	A4
2853	A3
2854	B2
2856	C4
2857	C4
2858	C4
2859	C3
2860	A2
2861	A2
2862	A1
2863	A1
2864	B3
2865	C1
2866	E3
2867	F1
2869	E3
2870	H4
2871	H2
2872	F4
2873	G2
2874	H3
2875	H2
2876	G3
2877	G4
2878	G4
2879	G4
2880	C1
2881	E4
2882	G4
2884	F2
2887	C2
3700	C4
3701	B3
3702	B3
3703	B3
3704	B3
3705	A3
3706	A3
3707	A3
3708	A3
3709	D4
3710	E4
3711	A3
3712	B1
3713	E4
3714	E4
3715	E4
3716	B2
3717	B2
3720	C4
3725	B1
3726	B1
3800	E2
3801	D2
3802	E2
3803	D2
3804	E2
3805	D2
3806	D2
3807	E2
3808	E1
3809	B3
3810	E2
3811	D3
3812	E2
3813	F1
3816	F1
3817	F2
3818	F1
3819	D4
3820	F1
3821	G1
3822	F2
3823	F2
3824	G1
3825	C2
3826	C2
3827	C2
3828	C4
3830	B2
3831	C4
3832	C4
3833	C2
3834	E3
3837	B2
3838	B2
3839	B3
3840	B3
3841	F3
3842	B3
3843	F3
3844	F3
3845	B2
3846	F3
3847	E3
3848	B2
3849	F3
3850	F3
3851	G3
3852	G2
3853	F2
3854	B4
3855	B4
3856	B3
3857	E1
3858	A2
3859	A2
3860	A2
3861	A2
3862	C2
3863	B2
3864	C4
3865	B4
3866	B4
3867	C2
3869	B3
3870	C1
3871	G4
3872	D4
3873	C4
3874	D4
3875	D4
3876	D4
3877	G4
3878	E4
3879	G3
3880	H3
3881	H3
3882	H4
3883	H3
3884	H3
3885	H2
3886	G2
3887	F4
3888	G4
3889	C4
3890	D4
3891	E1
3893	F2
3894	D3
3895	D3
3896	F4
3897	F2
3898	C1
3899	C1
5801	B1
5802	C1
6871	F4
6872	F4
6873	F4
6874	F4
6875	F4
7806	F3
7807	G3
7808	E3
7812	E4
7851	B4
7871	H3
7873	F4
7874	D4
7875	C1
9800	C1
9802	D4
9803	C1
9804	B4
9805	A2
9806	B4
9808	A2
9809	A2
9810	A2
9811	A2
9812	A3
9821	G3
9822	G3
9823	C3
9825	E3
9826	G4
9829	B2
9831	F4
9832	E4
9833	E2
9834	E2
9835	F2
9837	E4
9839	B2
9840	D4
9841	B4
9842	B4
9843	B4
9844	B4
9845	B4
9846	C4
9847	D4
9848	D4
9849	B3
9850	E2
9852	A4
9853	E4
9854	D4
9855	B3
9856	D2
9857	B2
9858	F2
9859	B1
9860	D2
9861	B3
9862	A1
9863	D1
9864	G4
9865	A4
9866	C1
9867	G4
9868	A1
9869	D1
9870	B1
9871	B1
9874	B2
9875	B1
9876	B1
9881	D4
9882	C2
9883	D4
9884	E4
9887	C4
9888	D1
9889	F2
9890	D1

Circuit Diagram Main Board part2



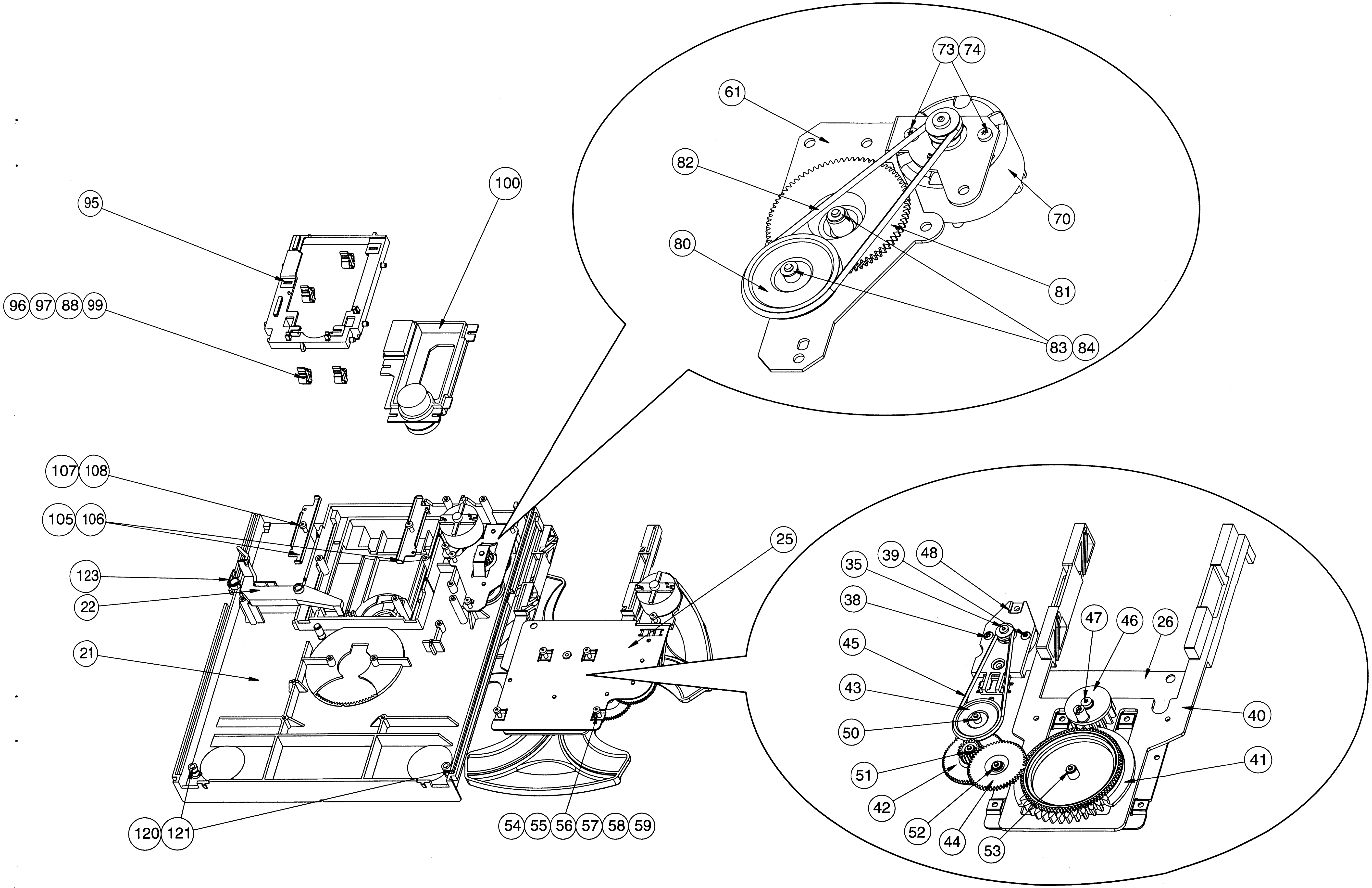
CD-Text circuitry
7876
LC89170M
to 7800 on part 1
RCK
SUB
SBSY
SFSY
CL4
7.35KHz
MP885
4MHz
+4V
3705
47R
9812
3703 470R
3704 470R
3701 470R
3702 470R
3700 470R
MP881
MP882
MP883
MP884
EXCK
SBSO
SCOR
WFCK
MCK
XMODE
GND
VDD
DQSY
SRDT
SCLK
SW2
SW1
TEST
32 x 8 2 PORT RAM
CPU INTERF
CRC CHECK
TIMING & SYNC PROTECTION
MP886 3.8V
3711 10K
3706 470R
3707 470R
3708 470R
MP888
MP889
MP887
2853 100n
7851
TDA1311
Continuous Calibration DAC
FREQUENCY DIVIDER
RIGHT CHANNEL REGISTER
LEFT CHANNEL REGISTER
CONTROL AND TIMING
VREF
Vor 8
Vol 6
BCK
WS
DATA
GND
VDD
from 7800 on part 1
DacData
MP835
MP834
MP833
MP819
3832 470R
3865
3866 470R
GNDA
+5V
100R 3869
4.75V
MP836
2851 100n
2852 470u
3855 15K
MP880
3854 18K
2857 47u
2858 100n
3720 10R
only for TDA1545
IREF
to 1805
2860 10u
2861 10u
3858 22K
3859 22K
470R 3860
470R 3861
2862 2n2
2863 2n2
2830 100n
MP854
MP857
3872 10K
3874 10K
+4V
SCL
SILD
SDA
MP863
7874 BC547B
3876 220K
MP869
3875 10K
+5V
from 7800 on part 1
EBU
3809 47R
MP890
2864 47p
3716 120R
EBUGND
3717 1R
2854 100n
9803
5802 TYPE
3712 68R
5801 2u2
COAX1
MP891
COAX2
to 1805
MP892
2865 22n
digital out circuitry
7871
TDA7073A
MP822
MP823
MP825
MP824
1876
1878
RF-500TB
2870 100n
2871 22n
Carrousel-motor
Tray-motor
OUT1-
VDD
0V
2V
MP871 10V
3851 3R3
+10V
2874 22n
2873 100n
2875 22n
2829 10u
3880 330R
3881 10K
3879 10K
3882 47K
3883 100K
3884 3K9
3885 100K
3886 47K
MP866 1880
to 1801 on part 1
INNERSW1
INNERSW2
3721 470R
2891 10u
2882 22n
3878 10K
CARR. SW
TRAY SW
CDM-POS
1882
1880
1881
MP866
MP868
MP867
6873
6871
6872
6874
1N4148
7873
HEF4094BP
VSS
VDD
DATA
SHR_CL
STR_OUT
STR
5V
Os
O7
O6
O5
O4
O3
O2
O1
O0
MP803
2872 100n
Power-on Reset
2881 4u7
3714 10K
3713 100K
3715 100K
7812 BC547B
for provision only
3896 10K
9800 @
MP865
MP802
7875 BC547B
3898 560R
3899 180R
2880 10n
3870 560R
+10V
MP801
3887 220R
6875 BZX79-C5V1
2876 470u
3877 10K
3871 10K
3888 10K
2877 82p
2878 220p
2879 220p
to 7800 on part 1
MP808
MP805
MP806
MP811
MP810
MP809
MP807
PORE
MP804
@... for pr

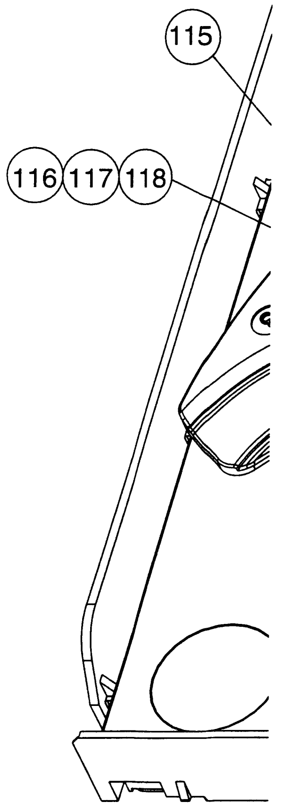
ITEM	OPT_OUT	COAX_OUT
5802	NO	YES
5801	YES	NO
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	NO	YES
2865	NO	YES
2864	YES	YES
2854	NO	YES


5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
7851
TDA1311
Continuous Calibration DAC
FREQUENCY DIVIDER
RIGHT CHANNEL REGISTER
LEFT CHANNEL REGISTER
CONTROL AND TIMING
VREF
Vor 8
Vol 6
VDD
BCK
WS
DATA
GND
from 7800 on part 1
BCK
WS
DacData
MP835
MP834
MP833
MP819
3832 470R
3865 470R
3866 470R
GNDA
+5V
100R
3869
4.75V
MP836
2851 100n
2852 470u
GNDA GNDA
3855 15K
MP880
2857 47u
2858 100n
3854 18K
3720 10R
only for TDA1545
IREF
to 1805
2860 10u
2861 10u
3858 22K
3859 22K
3860 470R
3861 470R
2862 2n2
2863 2n2
2830 100n
MP854
MP857
GNDA
CD-TEXT INFO
4V
DQSY
only during TOC-reading
3.3ms
SCLK
SRDT
from kill-circuitry on part 1
KILLL
9804
9805
EBUGND
9806
KILLR
COAX2
COAX1
IREF
from digital-out circuitry
3726 (only stuffed, if 1805 -> 18pin)
3725 (only stuffed, if 1805 -> 15 pin)
10K
10K
'foolproof resistors'
3872 10K
3874 10K
+4V
+4V
SCL
SILD
SDA
MP863
7874
BC547B
3876 220K
MP869
3875 10K
+4V
+5V
9800 @
MP865
MP802
+4V
7875
BC547B
3898 560R
3899 180R
2880 10n
3870 560R
MP866
1880
3721 470R
2891 10u
2882 @ 22n
3878 10K
S
CARR. SW
1882
6873
MP866 1880
1N4148 6871
TRAY SW
MP868 1881
1N4148 6872
CDM-POS
MP867
1N4148 6874
1N4148
INNERSW1
INNERSW2
to 1801 on part 1
7873
HEF4094BP
VSS
VDD
Os
O7
O6
O5
O4
O3
O2
O1
O0
D
DATA
SHR_CL
STR
STR_OUT
5V
MP803
2872 100n
3896 10K
7871
TDA7073A
0V
2 0V
VDD
OUT1-
MP871 10V
3851 3R3
+10V
2874 22n
3880 330R
3881 10K
3879 10K
3882 47K
2873 100n
2875 22n
2829 10u
3884 3K9
3883 100K
3885 100K
3886 47K
0V
+10V
MP801
3887 220R
6875 BZX79-C5V1
2876 470u
3877 10K
3871 10K
3888 10K
2877 82p
2878 220p
2879 220p
to 7800 on part 1
2881 4u7
3714 10K
3713 100K
3715 100K
7812 BC547B
Power-on Reset
for provision only
MP856
GNDA
MP899
MP808
MP805
MP806
MP811
MP810
MP809
MP807
MP804
PORE
DIGout / KILL
23 GND
22 SRDT
21 DQSY
20 uP_CLK
19 GND
18 COAX1/IREF/+5
17 COAX2/KILLR/EBU
16 GEBU/KILLL
15 LEFT
14 GNDA
13 RIGHT
12 +5V
11 GND
10 +10V
9 SW_INFO
8 STR_OUT
7 SHR_CL
6 SICL
5 DATA
4 SILD
3 GND
2 PORE
1 OE_LATCH
1805
CD-TEXT
BASIC VERSION
to connector board on rear side of module
@... for provision only

1805 G14	3876 C11	MP
1876 E3	3877 E11	MP
1878 F3	3878 D7	MP
1880 D8	3879 E6	MP
1881 E8	3880 E6	MP
1882 D8	3881 E6	MP
2829 F6	3882 E7	MP
2830 B12	3883 F7	MP
2851 C8	3884 F6	MP
2852 C8	3885 F7	MP
2853 B2	3886 F7	MP
2854 C2	3887 E12	MP
2857 C9	3888 E12	MP
2858 C9	3896 G10	MP
2860 A10	3898 D12	MP
2861 B10	3899 D12	
2862 A11	5801 C4	
2863 B11	5802 C3	
2864 D2	6871 D8	
2865 D3	6872 E8	
2870 E4	6873 D8	
2871 F4	6874 E8	
2872 G10	6875 F12	
2873 F6	7812 G8	
2874 E6	7851 A6	
2875 F6	7871 E5	
2876 E12	7873 D10	
2877 G11	7874 C11	
2878 G11	7875 D12	
2879 G11	7876 A2	
2880 D12	9800 D12	
2881 G8	9803 C3	
2882 D7	9804 B14	
3700 B2	9805 B14	
3701 B2	9806 B14	
3702 B2	9808 A10	
3703 A2	9809 A10	
3704 A2	9810 B10	
3705 A2	9811 B10	
3706 A4	9812 A2	
3707 B4	MP801 E12	
3708 B4	MP802 D13	
3711 A4	MP803 F10	
3712 C3	MP804 G13	
3713 G8	MP805 F13	
3714 G8	MP806 F13	
3715 G8	MP807 G13	
3716 D2	MP808 F13	
3717 C2	MP809 G13	
3720 C9	MP810 G13	
3725 D15	MP811 F13	
3726 C15	MP819 C6	
3809 C2	MP822 E4	
3832 B6	MP823 E4	
3851 E6	MP824 F4	
3854 B9	MP825 F4	
3855 C8	MP833 C5	
3858 A10	MP834 B5	
3859 B10	MP835 B5	
3860 A10	MP836 C8	
3861 B10	MP854 A12	
3865 B6	MP856 E13	
3866 C6	MP857 B12	
3869 C8	MP863 C11	
3870 E12	MP865 D12	
3871 E11	MP866 D8	
3872 B13	MP867 E8	
3874 B13	MP868 E8	
3875 C12	MP869 C11	

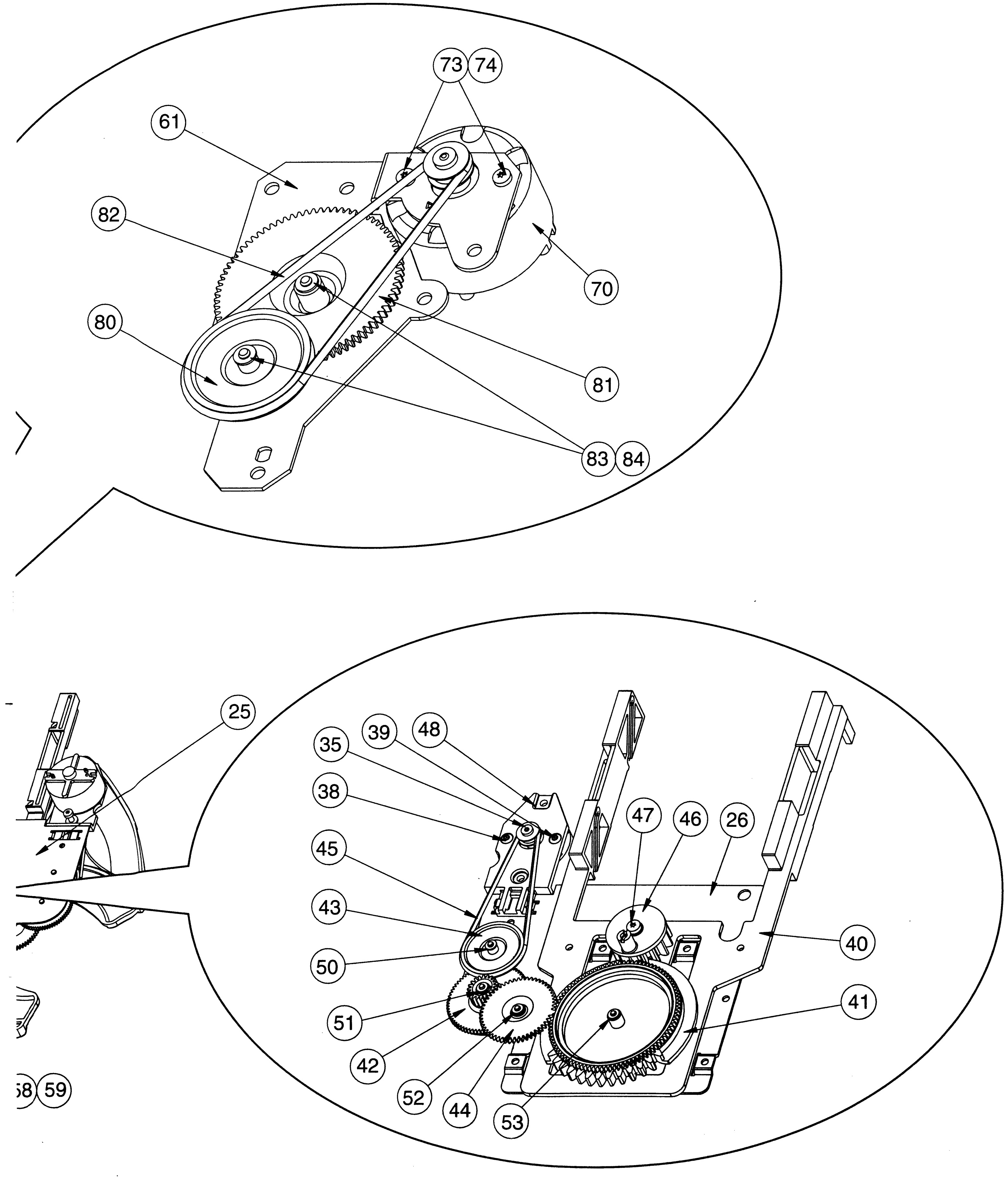
EXPLODED VIEW (3CDC MODULE)

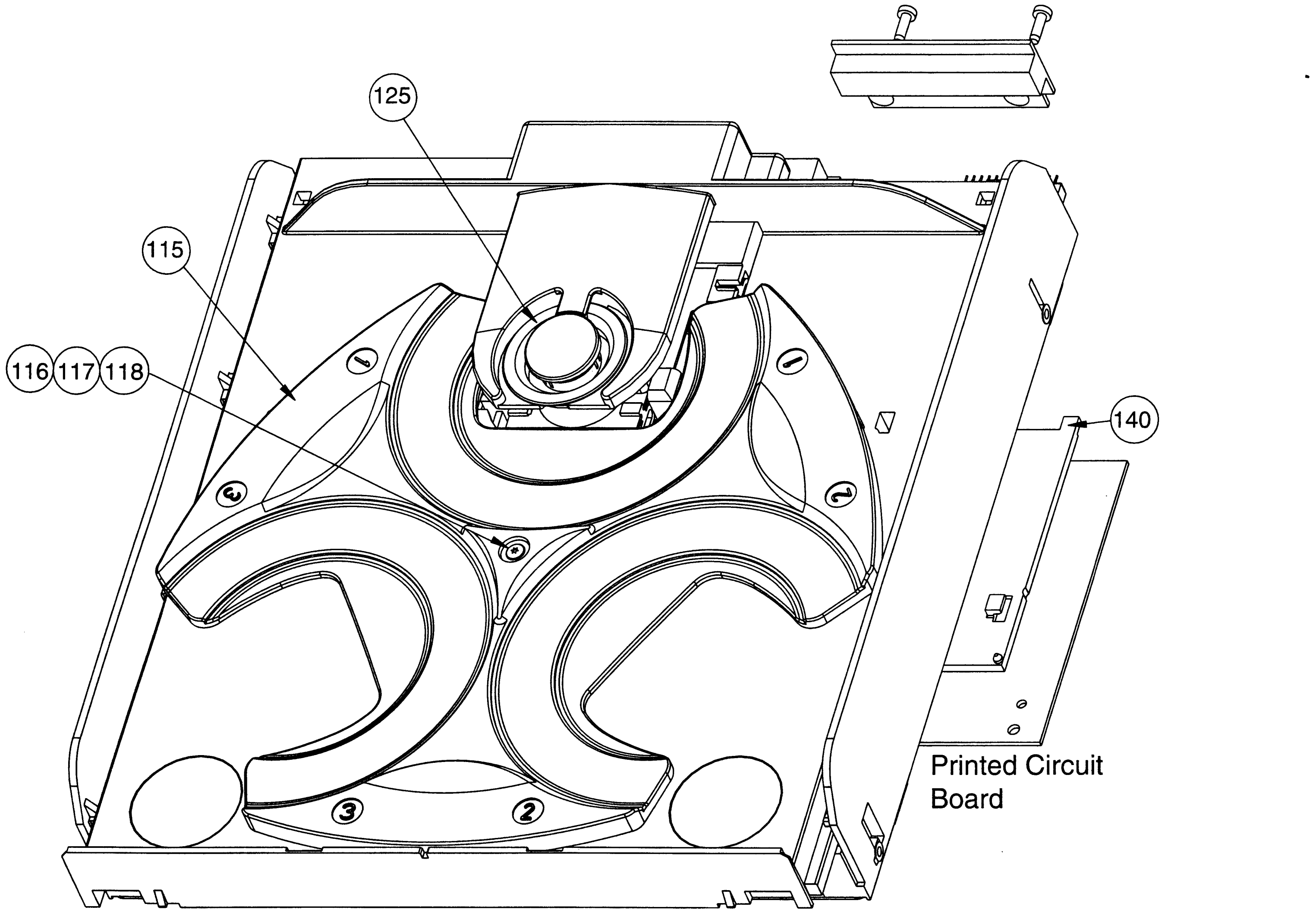

73
74
61
82
70
80
81
83
84
100
95
96
97
88
99
107
108
105
106
123
22
21
25
35
39
48
38
45
43
50
51
42
52
44
53
47
46
26
40
41
120
121
54
55
56
57
58
59


115
116
117
118

MECHANICAL PARTSLIST

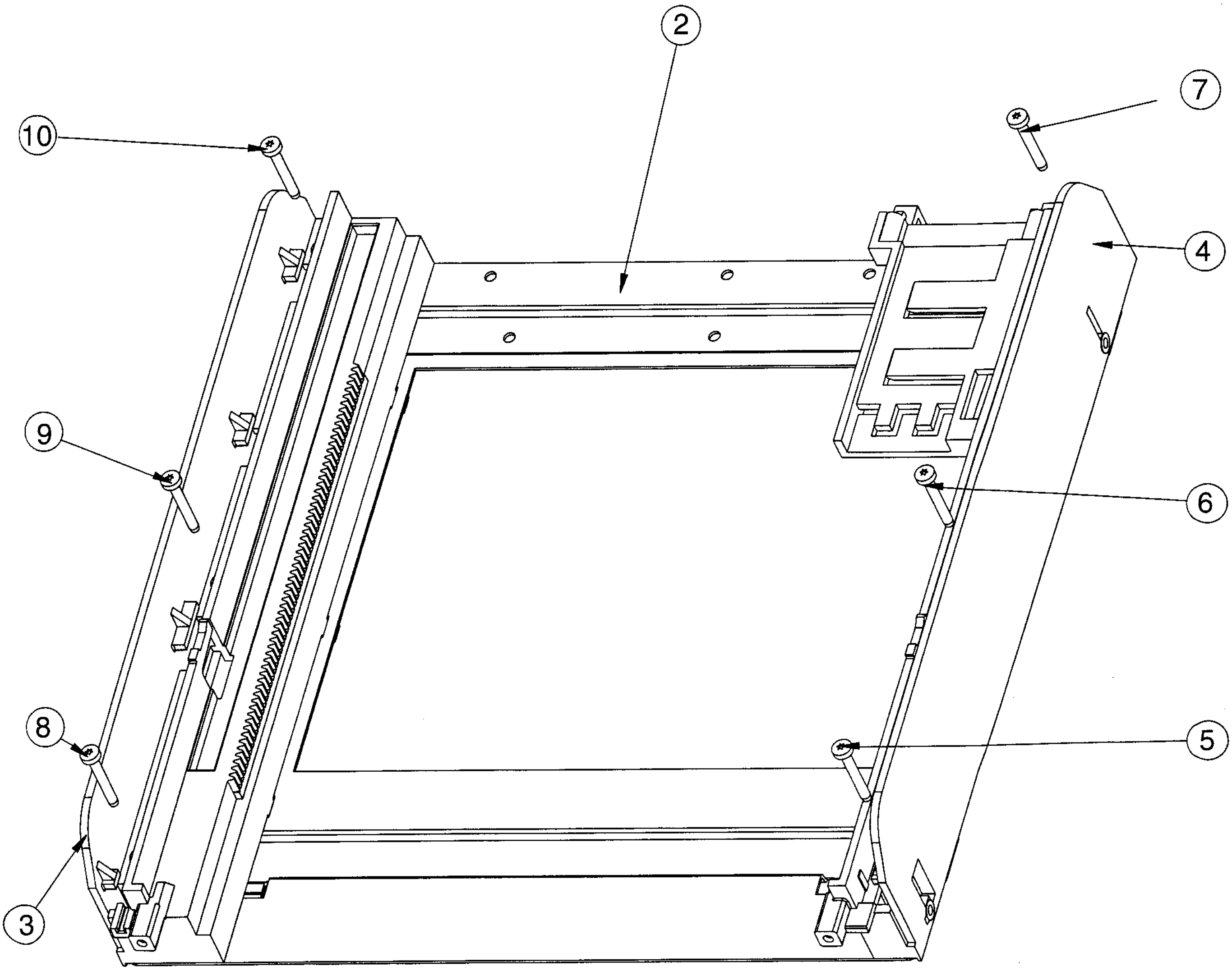
	4822 390 101 36
3	4822 463 110 08
4	4822 463 110 09
21	4822 441 116 15
22	4822 402 100 88
38	4822 502 125 48
39	4822 502 125 48
40	4822 463 110 11
41	4822 522 105 09
42	4822 522 104 92


73
74
61
82
70
80
81
83
84
25
35
39
48
38
47
46
26
45
43
40
50
41
51
42
52
44
53
59


125
115
116
117
118
140
1
2
3
Printed Circuit Board

MECHANICAL PARTSLIST 3CDC MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)
3	4822 463 11008	GUIDE LEFT
4	4822 463 11009	GUIDE RIGHT
21	4822 441 11615	DRAWER
22	4822 402 10088	BRACKET TUMBLER
38	4822 502 12548	SCREW M2,6X3,5
39	4822 502 12548	SCREW M2,6X3,5
40	4822 463 11011	SLIDE
41	4822 522 10509	CONTROL DISC
42	4822 522 10492	GEAR WHEEL
43	4822 528 10937	PULLEY
44	4822 522 10493	IDLER WHEEL
45	4822 358 10115	BELT
46	4822 466 10735	ECCENTRIC GEAR WHEEL
50	4822 532 12364	WASHER
51	4822 532 12364	WASHER
52	4822 532 12364	WASHER
53	4822 532 12364	WASHER
35	4822 361 10753	CARROUSEL MOTOR
70	4822 361 10753	CARROUSEL MOTOR



MECHANICAL PARTSLIST 3CDC MODULE

73	4822 502 12548	SCREW M2,6X3,5
74	4822 502 12548	SCREW M2,6X3,5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10894	SUPPORT
96	4822 325 50215	SUSPENSION
97	4822 325 50215	SUSPENSION
98	4822 325 50215	SUSPENSION
99	4822 325 50215	SUSPENSION
100	4822 691 10615	CD DRIVE VAM1201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
120	4822 532 51756	GROMMET
121	4822 532 51756	GROMMET
123	4822 402 10085	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP
140	4822 466 10734	PLATE

CS 53 014

ELECTRICAL PARTSLIST 3CDC MODULE

MISCELLANEOUS

1800	4822 267 51453	Flex Foil connector 12pin
1805	4822 265 10979	Flex Foil connector 15pin
1805	4822 265 11182	Flex Foil connector 23pin
1805	4822 265 11184	Flex Foil connector 18pin
1806	4822 265 10981	Flex Foil connector 15pin
1806	4822 267 10757	Flex Foil connector 23pin top entry
1806	4822 265 11185	Flex Foil connector 18pin top entry
1860	4822 265 11183	Flex Foil connector 4pin side entry
1880	4822 276 13503	Switch
1881	4822 276 13503	Switch
1882	4822 276 13503	Switch
8002	4822 320 11974	Flex Foil 15pin length= 190mm
8002	4822 320 12229	Flex Foil 18pin length= 190mm
8002	4822 320 12231	Flex Foil 23pin length= 190mm
8002	4822 320 12232	Flex Foil 15pin length= 480mm

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 126 12787	330pF	10%	50V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12878	1,5nF	10%	16V
2808	4822 122 10466	220pF	10%	50V
2809	4822 126 12882	100nF	20%	50V
2810	4822 122 10459	560pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2812	4822 122 10319	82pF	5%	50V
2813	4822 122 10319	82pF	5%	50V
2814	4822 122 33849	150pF	10%	50V
2815	4822 122 33192	27pF	5%	50V
2817	4822 122 33849	150pF	10%	50V
2819	4822 122 33848	47pF	5%	50V
2820	4822 122 33848	47pF	5%	50V
2821	4822 122 10462	15pF	5%	50V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12882	100nF	20%	50V
2826	4822 124 23624	470µF	20%	16V
2827	4822 126 12882	100nF	20%	50V
2828	4822 126 12882	100nF	20%	50V
2829	4822 124 41579	10µF	20%	50V
2830	4822 126 12882	100nF	20%	50V
2831	4822 124 12032	4,7µF	20%	50V
2832	4822 124 12032	4,7µF	20%	50V
2833	4822 122 33191	22pF	5%	50V
2834	4822 122 33191	22pF	5%	50V
2835	4822 126 12882	100nF	20%	50V
2837	4822 126 12882	100nF	20%	50V
2838	4822 126 12882	100nF	20%	50V
2839	4822 126 12882	100nF	20%	50V
2840	4822 126 12882	100nF	20%	50V
2841	4822 122 10574	1,2nF	10%	16V
2842	4822 121 51387	10nF	20%	16V
2843	4822 126 12882	100nF	20%	50V
2844	4822 122 10574	1,2nF	10%	16V
2845	4822 121 51387	10nF	20%	16V
2846	4822 126 11585	22nF	20%	50V
2847	4822 126 12882	100nF	20%	50V

CAPACITORS

2849	4822 126 11585	22nF	20%	50V
2850	4822 122 33197	1nF	10%	50V
2851	4822 126 12882	100nF	20%	50V
2852	4822 124 80857	470µF	20%	16V
2853	4822 126 12882	100nF	20%	50V
2856	4822 122 33848	47pF	5%	50V
2859	4822 126 12882	100nF	20%	50V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 126 12339	2,2nF	10%	16V
2863	4822 126 12339	2,2nF	10%	16V
2864	4822 122 33848	47pF	5%	50V
2866	4822 126 12882	100nF	20%	50V
2867	4822 122 33848	47pF	5%	50V
2868	4822 126 12882	100nF	20%	50V
2869	4822 126 12882	100nF	20%	50V
2870	4822 126 12882	100nF	20%	50V
2871	4822 126 11585	22nF	20%	50V
2872	4822 126 12882	100nF	20%	50V
2873	4822 126 12882	100nF	20%	50V
2874	4822 126 11585	22nF	20%	50V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 80857	470µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 122 10466	220pF	10%	50V
2880	4822 121 51387	10nF	20%	16V
2884	4822 126 12882	100nF	20%	50V
2887	4822 126 12882	100nF	20%	50V
2890	4822 124 23624	470µF	20%	16V
2891	4822 124 12125	10µF	20%	16V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3701	4822 116 83883	470Ω	5%	0,16W
3702	4822 116 83883	470Ω	5%	0,16W
3703	4822 116 83883	470Ω	5%	0,16W
3704	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 52195	47Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3710	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3717	4822 116 80176	1Ω	5%	0,5W
3720	4822 116 52176	10Ω	5%	0,5W
3721	4822 116 83883	470Ω	5%	0,16W
3725	4822 116 83864	10kΩ	5%	0,5W
3726	4822 116 83864	10kΩ	5%	0,5W
3800	4822 116 52239	120kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52239	120kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3804	4822 116 52291	56kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 52175	100Ω	5%	0,5W
3810	4822 050 11002	1kΩ	5%	0,2W
3812	4822 116 83884	47kΩ	5%	0,16W
3813	4822 116 83864	10kΩ	5%	0,5W
3816	4822 116 52269	3,3kΩ	5%	0,5W

ELECTRICAL PARTSLIST 3CDC MODULE

RESISTORS

3817	4822 116 83961	6,8kΩ	5%	0,16W
3818	4822 116 83864	10kΩ	5%	0,5W
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52269	3,3kΩ	5%	0,5W
3821	4822 116 52269	3,3kΩ	5%	0,5W
3822	4822 116 52257	22kΩ	5%	0,5W
3823	4822 116 52269	3,3kΩ	5%	0,5W
3824	4822 116 52269	3,3kΩ	5%	0,5W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52278	390kΩ	5%	0,5W
3828	4822 116 52257	22kΩ	5%	0,5W
3830	4822 116 52235	1MΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83883	470Ω	5%	0,16W
3833	4822 116 83864	10kΩ	5%	0,5W
3834	4822 116 52283	4,7kΩ	5%	0,5W
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52245	150kΩ	5%	0,16W
3840	4822 116 52245	150kΩ	5%	0,16W
3841	4822 116 83961	6,8kΩ	5%	0,16W
3842	4822 116 83864	10kΩ	5%	0,5W
3843	4822 116 52303	8,2kΩ	5%	0,5W
3844	4822 116 52226	560Ω	5%	0,5W
3844	4822 116 83883	470Ω	5%	0,16W
3845	4822 116 83864	10kΩ	5%	0,5W
3846	4822 116 52303	8,2kΩ	5%	0,5W
3847	4822 116 52228	680Ω	5%	0,5W
3847	4822 116 83883	470Ω	5%	0,16W
3848	4822 116 52303	8,2kΩ	5%	0,5W
3849	4822 116 52303	8,2kΩ	5%	0,5W
3850	4822 116 83883	470Ω	5%	0,16W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10338	3,3Ω		NFR25
3853	4822 052 10338	3,3Ω		NFR25
3856	4822 116 52219	330Ω	5%	0,5W
3856	4822 116 80176	1Ω	5%	0,5W
3857	4822 050 11002	1kΩ	5%	0,2W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83883	470Ω	5%	0,16W
3861	4822 116 83883	470Ω	5%	0,16W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3865	4822 116 83883	470Ω	5%	0,16W
3866	4822 116 83883	470Ω	5%	0,16W
3867	4822 116 52234	100kΩ	5%	0,5W
3868	4822 116 52191	33Ω	5%	0,5W
3869	4822 116 52175	100Ω	5%	0,5W
3870	4822 116 52226	560Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83874	220kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W
3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 052 10221	220Ω	5%	
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 116 83883	470Ω	5%	0,16W
3891	4822 116 52272	330kΩ	5%	0,5W
3893	4822 116 52257	22kΩ	5%	0,5W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3896	4822 116 83864	10kΩ	5%	0,5W
3897	4822 116 52226	560Ω	5%	0,5W
3898	4822 116 52226	560Ω	5%	0,5W
3899	4822 116 52213	180Ω	5%	0,5W

COILS

1810	4822 242 10849	CRYSTAL 8MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5801	4822 157 11477	2,2μH

DIODES

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1

TRANSISTORS

7808	4822 130 41344	BC337-40
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7800 ©	4822 209 12752	SAA7378GP (Signal Processor CD7)
7801 ©	5322 209 11517	PC74HCU04T (HF Amplifier)
7806	4822 209 32852	TDA7073A/N2 (Servo Driver)
7807	4822 209 32852	TDA7073A/N2 (Motor Driver)
7810	4822 130 10845	OPTICAL OUT UNIT
7851	4822 209 32421	TDA1311A/N2(DAC)
7871	4822 209 32852	TDA7073A/N2 (Motor Driver)
7873	5322 209 10421	HEF4094BP (Shift Register)
7876	4822 209 16143	LC89170M (CD Text)

COMBI BOARD

TABLE OF CONTENTS

Brief Introduction 11-1
Main part - Component and Chip layouts 11-2
Main part - Source Select & Amplifier 11-3
Main part - Power Supply 11-4
Transformer Primary part - Circuit & Layout 11-5
Karaoke & Headphone part - Circuit & Layouts 11-6
CDC Key part - Circuit & Layouts 11-7
Electrical parts list... 11-8

Brief introduction of the Combi Board

NOTE

A. TRANSFORMER PRIMARY PART

Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +12A, +12M, -26V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

C. SOURCE SELECT & AMPLIFIER PART

a) SHIFT REGISTER (AF CONTROL)

This shift register deliver commands from the µP to control the AF functions which include source selection (A0 & A1 control lines), DSC modes , DBB, IS and CD_ON. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the µP on the Front board.

b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to th e selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

c) PWM VOLUME CONTROL

The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (BC557B or ON4986) and PWM control signal from µP. For good performance transistors for the left and right channels should be paired for gain characteristics.

d) SOUND FEATURES

Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069BT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER

IC 7391 (AN7125) is used as power amplifier.

f) CD ON CONTROL

This circuit switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

D. KARAOKE & HEADPHONE PART

a) SIMPLE KARAOKE

This is a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

g) HEADPHONE OUTPUT

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

Brief introduction of the Combi Board

A. TRANSFORMER PRIMARY PART

Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +12A, +12M, -26V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

C. SOURCE SELECT & AMPLIFIER PART

a) SHIFT REGISTER (AF CONTROL)

This shift register deliver commands from the µP to control the AF functions which include source selection (A0 & A1 control lines), DSC modes, DBB, IS and CD_ON. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the µP on the Front board.

b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to th e selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

c) PWM VOLUME CONTROL

The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (BC557B or ON4986) and PWM control signal from µP. For good performance transistors for the left and right channels should be paired for gain characteristics.

d) SOUND FEATURES

Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069BT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

e) POWER AMPLIFIER

IC 7391 (AN7125) is used as power amplifier.

f) CD ON CONTROL

This circuit switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

D. KARAOKE & HEADPHONE PART

a) SIMPLE KARAOKE

This is a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

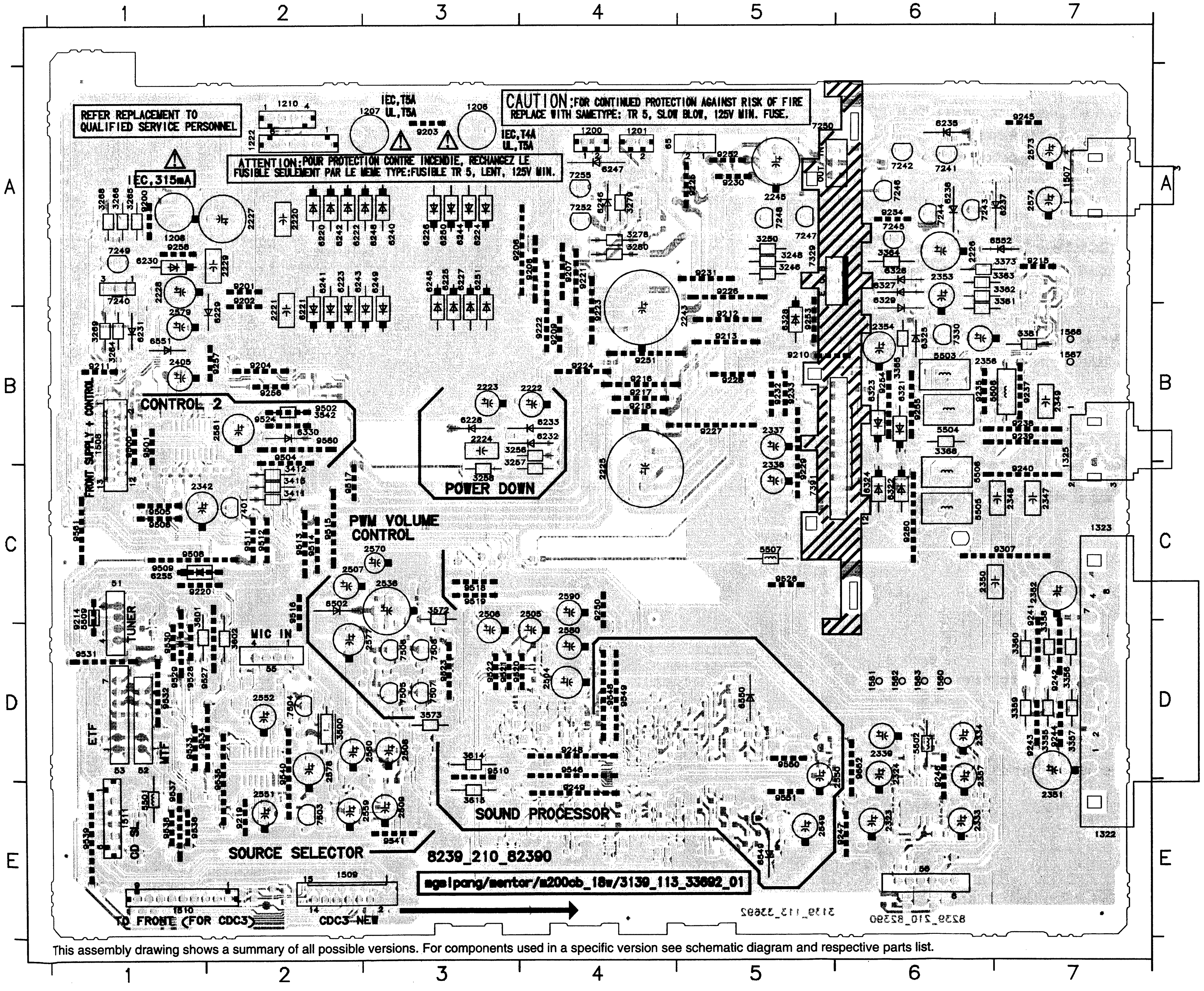
g) HEADPHONE OUTPUT

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

NOTES:

COMPONENT LAYOUT - MAIN PART

51	C1	1508	B1	2227	A2	2351	E7	2552	D2	3258	C3	3363	A7	5501	E1	6228	B3	6248	A3	6550	D5	7330	B6	9209	B4	9226	A5	9244	D7	9500	B1	9519	C3	9537	E1
52	D1	1509	E2	2228	A1	2352	C7	2559	E3	3264	B1	3364	A6	5502	D6	6229	B2	6249	A3	6551	B1	7391	C5	9210	B5	9227	B5	9245	A7	9501	B1	9520	D3	9538	E1
53	D1	1510	E1	2229	A2	2353	A6	2560	D3	3265	A1	3365	B6	5503	B6	6230	A1	6250	A3	6552	A7	7401	C2	9211	B1	9228	B5	9246	D6	9502	B2	9521	D3	9539	E1
55	D2	1511	E1	2243	B5	2354	B6	2570	C3	3266	A1	3366	B6	5504	B6	6231	B1	6251	A3	7240	A1	7503	E2	9212	B5	9229	C5	9247	E6	9504	B2	9522	D3	9540	D2
56	E6	1560	D6	2245	A5	2356	B6	2573	A7	3268	A1	3373	A7	5505	C6	6232	B4	6255	C1	7241	A6	7504	D2	9213	B5	9230	A5	9248	D4	9505	C1	9523	D3	9541	E3
65	A4	1561	D6	2323	E6	2357	D6	2574	A7	3269	B1	3381	B7	5506	C6	6233	B4	6321	B6	7242	A6	7505	D3	9214	C1	9231	A5	9249	E4	9506	C1	9524	B2	9546	D4
1200	A4	1562	D6	2324	D6	2405	B1	2577	D3	3278	A4	3411	C2	5507	C5	6235	A6	6322	C6	7243	A6	7506	D3	9215	A7	9232	B5	9250	C4	9508	C1	9526	C5	9548	D4
1201	A4	1563	D6	2333	E6	2504	D4	2578	D2	3279	A4	3412	C2	5508	B6	6236	A6	6323	B6	7244	A6	7507	D3	9216	B4	9233	B5	9251	B4	9509	C1	9527	D1	9549	D4
1206	A3	1566	B7	2334	D6	2505	C4	2579	B1	3280	A4	3413	C2	5509	C1	6237	A7	6324	C6	7245	A6	7508	D3	9217	B4	9234	A6	9252	A5	9510	D3	9528	D1	9550	D5
1207	A3	1567	B7	2337	B5	2506	C3	2580	D4	3355	D7	3500	D2	6220	A2	6240	A3	6325	B6	7246	A6	9200	A1	9218	B4	9235	B6	9253	B5	9511	C2	9529	D1	9551	E5
1208	A1	2220	A2	2338	C5	2507	C2	2581	B2	3356	D7	3542	B2	6221	B2	6241	A2	6326	A6	7247	A5	9201	A2	9219	E2	9237	B7	9254	B6	9512	C2	9530	D1	9552	D6
1210	A2	2221	B2	2339	D6	2508	D3	2590	C4	3357	D7	3572	C3	6222	A2	6242	A2	6327	A6	7248	A5	9202	A2	9220	C1	9238	B7	9255	B6	9513	C2	9531	D1	9560	B2
1222	A2	2222	B4	2342	C1	2509	E3	3246	A5	3358	D7	3573	D3	6223	A2	6243	A2	6328	B5	7249	A1	9203	A3	9221	A4	9239	B7	9256	B2	9514	C2	9532	D1	9561	C1
1322	E7	2223	B3	2347	C7	2536	C3	3248	A5	3359	D7	3601	C1	6224	A3	6244	A3	6329	A6	7250	A5	9204	B2	9222	B4	9240	C7	9257	B2	9515	C2	9533	D1		
1323	C7	2224	B3	2348	C7	2549	E5	3250	A5	3360	D7	3602	D2	6225	A3	6245	A3	6330	B2	7252	A4	9206	A3	9223	B4	9241	C7	9258	A1	9516	C2	9534	D1		
1325	B7	2225	C4	2349	B7	2550	D6	3256	B3	3361	A7	3614	D3	6226	A3	6246	A4	6502	C2	7255	A4	9207	A4	9224	B4	9242	D7	9260	C6	9517	C2	9535	D2		
1507	A7	2226	A6	2350	C6	2551	E2	3257	B3	3362	A7	3615	E3	6227	A3	6247	A4	6549	E5	7329	A5	9208	A4	9225	A5	9243	D7	9307	C7	9518	C3	9536	E1		

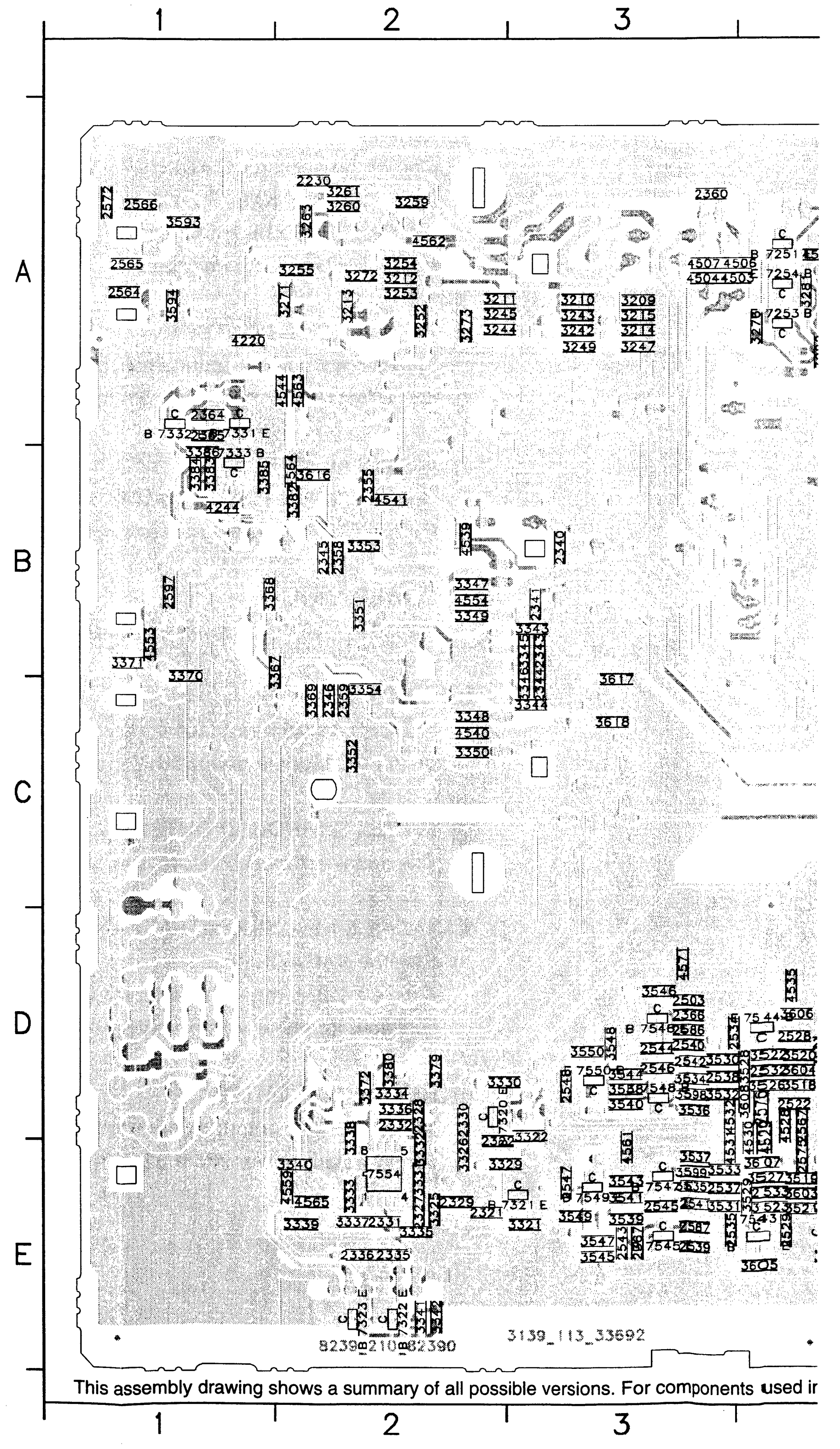


1
2
3
4
5
6
7
A
B
C
D
E
REFER REPLACEMENT TO QUALIFIED SERVICE PERSONNEL
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAMETYPE: TR 5, SLOW BLOW, 125V MIN. FUSE.
ATTENTION: POUR PROTECTION CONTRE INCENDIE, RECHANGEZ LE FUSIBLE SEULEMENT PAR LE MEME TYPE: FUSIBLE TR 5, LENT, 125V MIN.
IEC,315mA
IEC,T5A UL,T5A
IEC,T4A UL,T5A
CONTROL 2
FRONT SUPPLY + CONTROL
POWER DOWN
PWM VOLUME CONTROL
TUNER
MIC IN
ETF
MTF
SOUND PROCESSOR
SOURCE SELECTOR
8239_210_82390
mgsipang/mentor/m200cb_18w/3139_113_33692_01
TO FRONT (FOR CDC3)
CDC3-NEW

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CHIP LAYOUT - MAIN PART

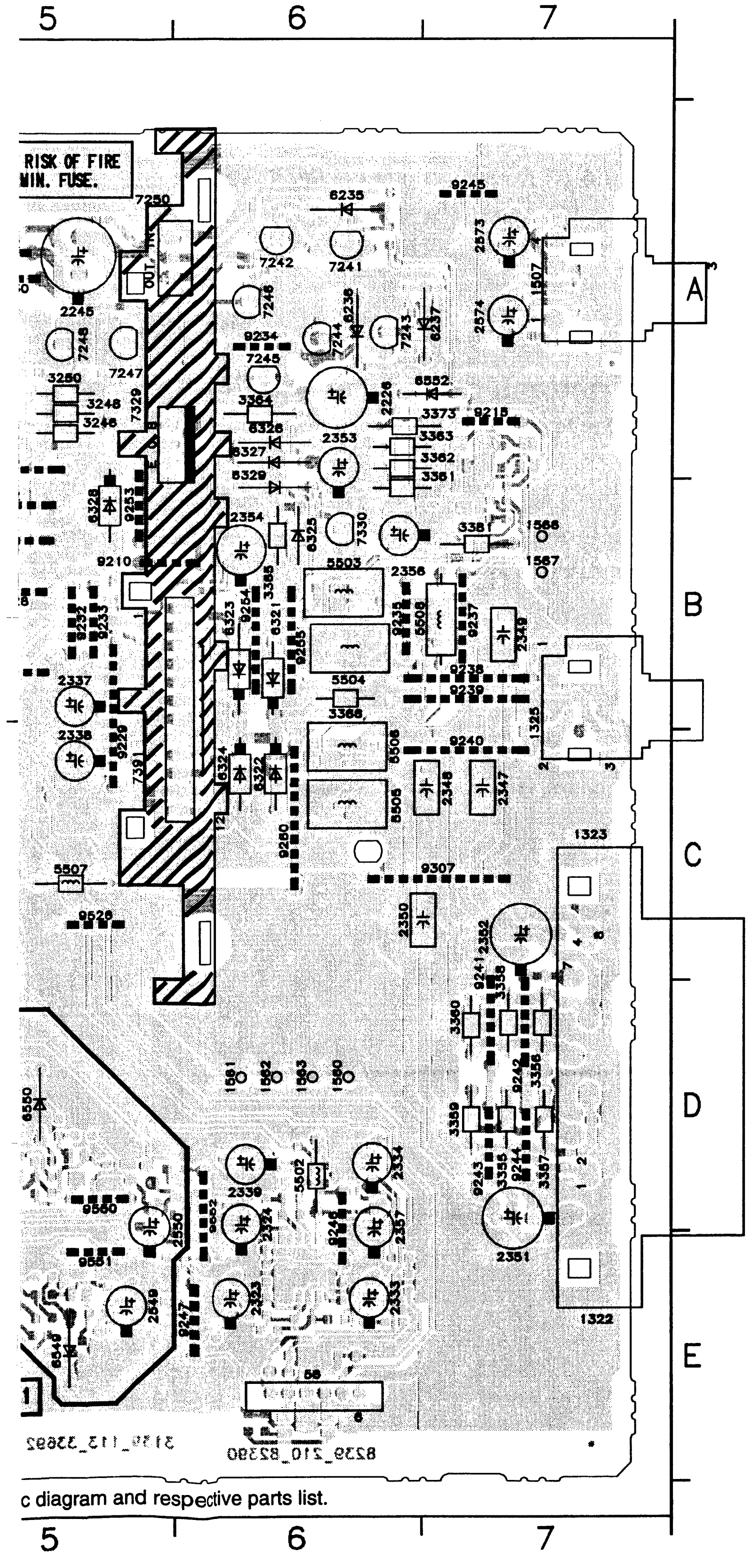
2230	A2	2364	A1	2523	E4	2548	D3	2587	E3	3253	A2	3331	E2	3367	B2	340
2321	E2	2365	A1	2524	D4	2553	D7	2588	E5	3254	A2	3332	E2	3368	B1	340
2322	E2	2366	D3	2525	E4	2554	D7	2589	E5	3255	A2	3333	E2	3369	C2	340
2327	E2	2367	E3	2526	D4	2555	C7	2591	D5	3259	A2	3334	D2	3370	B1	340
2328	D2	2400	C6	2527	E4	2556	C7	2592	D5	3260	A2	3335	E2	3371	B1	341
2329	E2	2401	C6	2528	D4	2557	E7	2594	D5	3261	A2	3336	D2	3372	D2	350
2330	D2	2402	C6	2529	E4	2558	E7	2595	D6	3263	A2	3337	E2	3378	B7	350
2331	E2	2403	B6	2530	D6	2561	E6	2596	D6	3271	A2	3338	D2	3379	D2	350
2332	D2	2501	E6	2531	D5	2562	C5	2597	B1	3272	A2	3339	E2	3380	D2	350
2335	E2	2502	D6	2532	D4	2563	E7	3209	A3	3273	A2	3340	E2	3382	B2	350
2336	E2	2503	D3	2533	E4	2564	A1	3210	A3	3274	A4	3341	E2	3383	B1	350
2340	B3	2510	D5	2534	D3	2565	A1	3211	A2	3275	A4	3342	E2	3384	B1	350
2341	B3	2511	D5	2535	E3	2566	A1	3212	A2	3276	A4	3343	B3	3385	B1	350
2343	B3	2512	D5	2537	E3	2567	D4	3213	A2	3277	A4	3344	C3	3386	B1	350
2344	C3	2513	D5	2538	D3	2568	B7	3214	A3	3281	A4	3345	B3	3387	B6	351
2345	B2	2514	D5	2539	E3	2569	B7	3215	A3	3282	A4	3346	C3	3388	B6	351
2346	C2	2515	E5	2540	D3	2572	A1	3242	A3	3283	A4	3347	B2	3390	E6	351
2355	B2	2516	D5	2541	E3	2575	E4	3243	A3	3321	E3	3348	C2	3391	E5	351
2358	B2	2517	E5	2542	D3	2576	D4	3244	A2	3322	D3	3349	B2	3392	D5	351
2359	C2	2518	D4	2543	E3	2582	D5	3245	A2	3325	E2	3350	C2	3400	C7	351
2360	A3	2519	E4	2544	D3	2583	E5	3247	A3	3326	E2	3351	B2	3401	B7	351
2361	D7	2520	D4	2545	E3	2584	D4	3249	A3	3328	D4	3352	C2	3402	B6	351
2362	B6	2521	E4	2546	D3	2585	E4	3251	B7	3329	E2	3353	B2	3403	B7	351
2363	B6	2522	D4	2547	E3	2586	D3	3252	A2	3330	D2	3354	C2	3404	B6	351



1
2
3
A
B
C
D
E
8239 210 82390
3139_113_33692

This assembly drawing shows a summary of all possible versions. For components used ir

30	B6	9209	B4	9226	A5	9244	D7	9500	B1	9519	C3	9537	E1
91	C5	9210	B5	9227	B5	9245	A7	9501	B1	9520	D3	9538	E1
01	C2	9211	B1	9228	B5	9246	D6	9502	B2	9521	D3	9539	E1
03	E2	9212	B5	9229	C5	9247	E6	9504	B2	9522	D3	9540	D2
04	D2	9213	B5	9230	A5	9248	D4	9505	C1	9523	D3	9541	E3
05	D3	9214	C1	9231	A5	9249	E4	9506	C1	9524	B2	9546	D4
06	D3	9215	A7	9232	B5	9250	C4	9508	C1	9526	C5	9548	D4
07	D3	9216	B4	9233	B5	9251	B4	9509	C1	9527	D1	9549	D4
08	D3	9217	B4	9234	A6	9252	A5	9510	D3	9528	D1	9550	D5
00	A1	9218	B4	9235	B6	9253	B5	9511	C2	9529	D1	9551	E5
01	A2	9219	E2	9237	B7	9254	B6	9512	C2	9530	D1	9552	D6
02	A2	9220	C1	9238	B7	9255	B6	9513	C2	9531	D1	9560	B2
03	A3	9221	A4	9239	B7	9256	B2	9514	C2	9532	D1	9561	C1
04	B2	9222	B4	9240	C7	9257	B2	9515	C2	9533	D1		
06	A3	9223	B4	9241	C7	9258	A1	9516	C2	9534	D1		
07	A4	9224	B4	9242	D7	9260	C6	9517	C2	9535	D2		
08	A4	9225	A5	9243	D7	9307	C7	9518	C3	9536	E1		

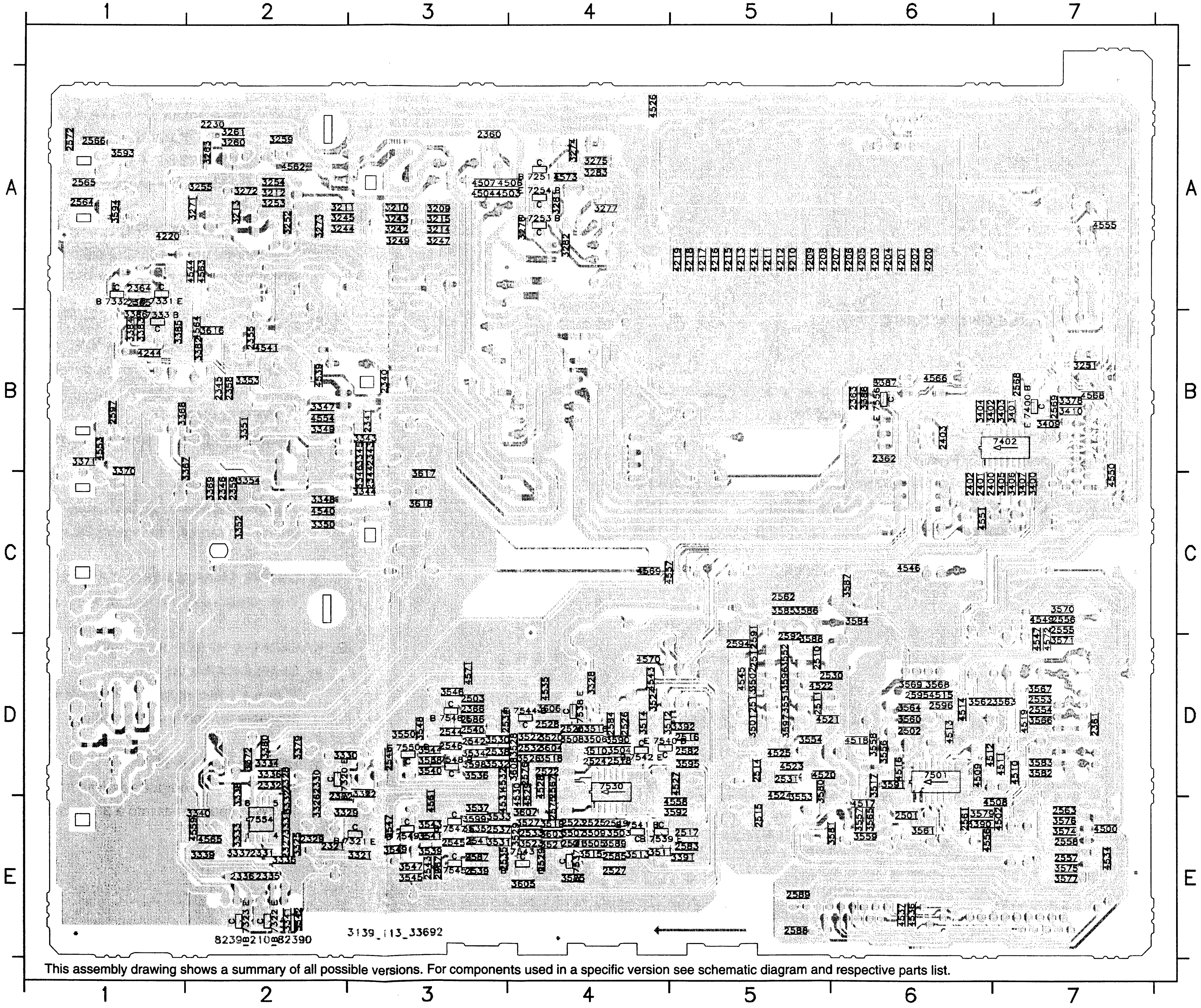


c diagram and respective parts list.

CHIP LAYOUT - MAIN PART

2230	A2	2364	A1	2523	E4	2548	D3	2587	E3	3253	A2	3331	E2	3367	B2	3405	C7
2321	E2	2365	A1	2524	D4	2553	D7	2588	E5	3254	A2	3332	E2	3368	B1	3406	C7
2322	E2	2366	D3	2525	E4	2554	D7	2589	E5	3255	A2	3333	E2	3369	C2	3407	C7
2327	E2	2367	E3	2526	D4	2555	C7	2591	D5	3259	A2	3334	D2	3370	B1	3409	B7
2328	D2	2400	C6	2527	E4	2556	C7	2592	D5	3260	A2	3335	E2	3371	B1	3410	B7
2329	E2	2401	C6	2528	D4	2557	E7	2594	D5	3261	A2	3336	D2	3372	D2	3501	D5
2330	D2	2402	C6	2529	E4	2558	E7	2595	D6	3263	A2	3337	E2	3378	B7	3502	D5
2331	E2	2403	B6	2530	D6	2561	E6	2596	D6	3271	A2	3338	D2	3379	D2	3503	E4
2332	D2	2501	E6	2531	D5	2562	C5	2597	B1	3272	A2	3339	E2	3380	D2	3504	D4
2335	E2	2502	D6	2532	D4	2563	E7	3209	A3	3273	A2	3340	E2	3382	B2	3505	E4
2336	E2	2503	D3	2533	E4	2564	A1	3210	A3	3274	A4	3341	E2	3383	B1	3506	D4
2340	B3	2510	D5	2534	D3	2565	A1	3211	A2	3275	A4	3342	E2	3384	B1	3507	E4
2341	B3	2511	D5	2535	E3	2566	A1	3212	A2	3276	A4	3343	B3	3385	B1	3508	D4
2343	B3	2512	D5	2537	E3	2567	D4	3213	A2	3277	A4	3344	C3	3386	B1	3509	E4
2344	C3	2513	D5	2538	D3	2568	B7	3214	A3	3281	A4	3345	B3	3387	B6	3510	D4
2345	B2	2514	D5	2539	E3	2569	B7	3215	A3	3282	A4	3346	C3	3388	B6	3511	E4
2346	C2	2515	E5	2540	D3	2572	A1	3242	A3	3283	A4	3347	B2	3390	E6	3512	D4
2355	B2	2516	D5	2541	E3	2575	E4	3243	A3	3321	E3	3348	C2	3391	E5	3513	E4
2358	B2	2517	E5	2542	D3	2576	D4	3244	A2	3322	D3	3349	B2	3392	D5	3514	D4
2359	C2	2518	D4	2543	E3	2582	D5	3245	A2	3325	E2	3350	C2	3400	C7	3515	E4
2360	A3	2519	E4	2544	D3	2583	E5	3247	A3	3326	E2	3351	B2	3401	B7	3516	D4
2361	D7	2520	D4	2545	E3	2584	D4	3249	A3	3328	D4	3352	C2	3402	B6	3517	D6
2362	B6	2521	E4	2546	D3	2585	E4	3251	B7	3329	E2	3353	B2	3403	B7	3518	D4
2363	B6	2522	D4	2547	E3	2586	D3	3252	A2	3330	D2	3354	C2	3404	B6	3519	E4

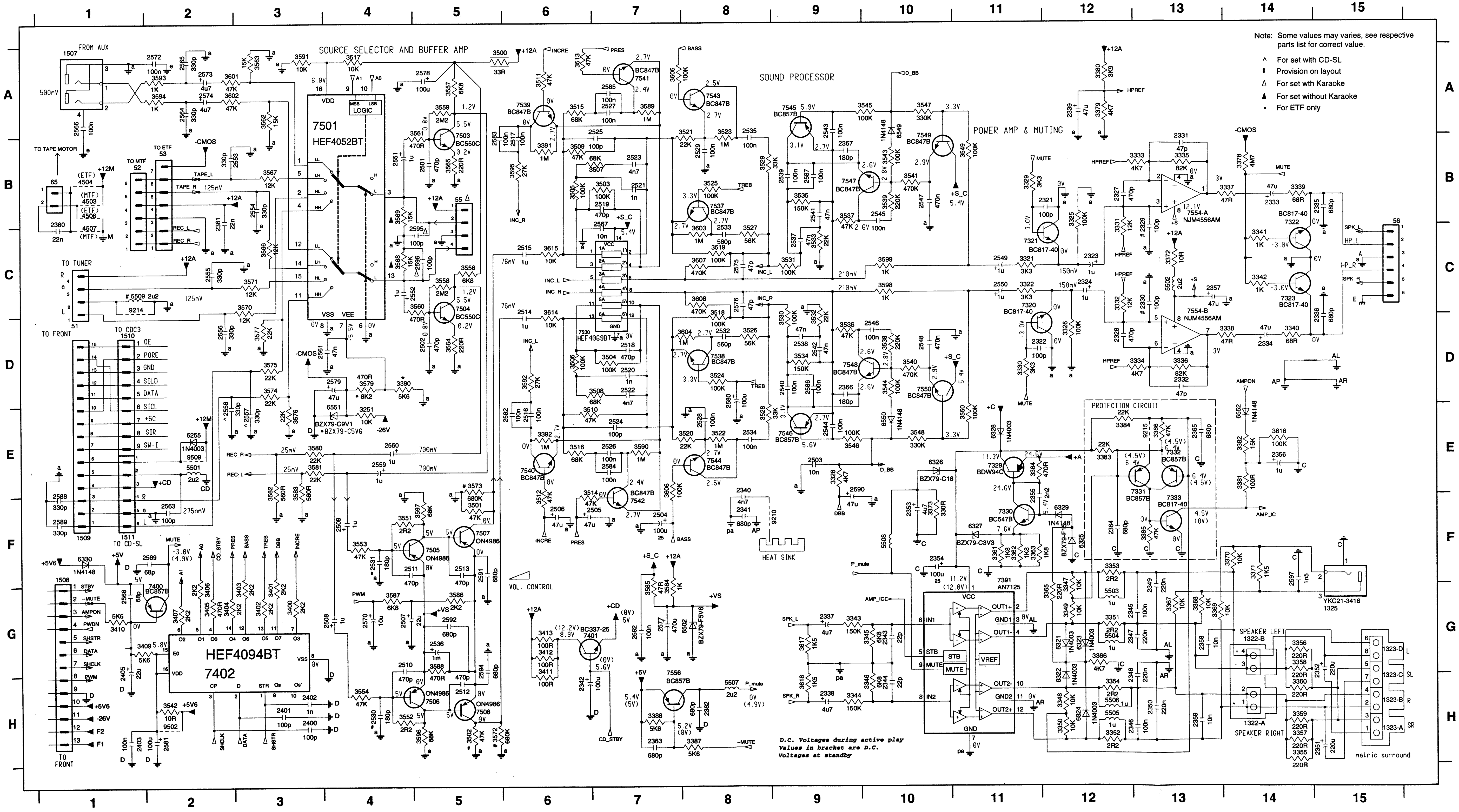
3520	D4	3545	E3	3570	C7	3597	D5	4212	A5	4516	D6	4543	D4	4571	D3	7544	D4
3521	E4	3546	D3	3571	D7	3598	D3	4213	A5	4517	E6	4544	A2	4572	D7	7545	E3
3522	D4	3547	E3	3574	E7	3599	E3	4214	A5	4518	D6	4545	D5	4573	A4	7546	D3
3523	E4	3548	D3	3575	E7	3603	E4	4215	A5	4519	D7	4546	C6	7251	A4	7547	E3
3524	D4	3549	E3	3576	E7	3604	D4	4216	A5	4520	D5	4547	D7	7253	A4	7548	D3
3525	E4	3550	D3	3577	E7	3605	E4	4217	A5	4521	D5	4549	C7	7254	A4	7549	E3
3526	D4	3551	D5	3579	E6	3606	D4	4218	A5	4522	D5	4550	C7	7320	D2	7550	D3
3527	E4	3552	D5	3580	D5	3607	E4	4219	A5	4523	D5	4551	C6	7321	E3	7554	E2
3528	D4	3553	E5	3581	E6	3608	D4	4220	A1	4524	D5	4553	B1	7322	E2	7556	B6
3529	E4	3554	D5	3582	D7	3616	B2	4244	B1	4525	D5	4554	B2	7323	E2		
3530	D3	3556	D6	3583	D7	3617	C3	4500	E7	4526	A4	4555	A7	7331	A1		
3531	E3	3557	E6	3584	C6	3618	C3	4502	E7	4527	D5	4556	E6	7332	A1		
3532	D3	3558	D6	3585	C5	4200	A6	4503	A4	4528	D4	4557	C5	7333	B1		
3533	E3	3559	E6	3586	C5	4201	A6	4504	A3	4529	D4	4558	E5	7400	B7		
3534	D3	3560	D6	3587	C6	4202	A6	4506	A4	4530	D4	4559	E2	7402	B7		
3535	E3	3561	E6	3588	D5	4203	A6	4507	A3	4531	E3	4561	E3	7501	D6		
3536	D3	3562	D6	3589	E4	4204	A6	4508	E7	4532	D3	4562	A2	7530	D4		
3537	E3	3563	D7	3590	D4	4205	A6	4509	D6	4534	E7	4563	A2	7537	E4		
3538	D3	3564	D6	3591	D6	4206	A6	4510	D7	4535	D4	4564	B2	7538	D4		
3539	E3	3565	E6	3592	E5	4207	A6	4511	D7	4536	E6	4565	E2	7539	E4		
3540	D3	3566	D7	3593	A1	4208	A5	4512	D6	4537	E6	4566	B6	7540	D4		
3541	E3	3567	D7	3594	A1	4209	A5	4513	D6	4539	B2	4568	B7	7541	E4		
3543	E3	3568	D6	3595	D5	4210	A5	4514	D6	4540	C2	4569	C4	7542	D4		
3544	D3	3569	D6	3596	D5	4211	A5	4515	D6	4541	B2	4570	D4	7543	E4		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CIRCUIT DIAGRAM - SOURCE SELECT & AMPLIFIER PART

51	D1
52	B1
53	B2
55	B5
56	C15
65	B1
1322-A	H14
1322-B	G14
1323-A	H15
1323-B	H15
1323-C	G15
1323-D	G15
1325	G15
1507	A1
1508	F1
1509	F1
1510	D1
1511	F1
2321	B12
2322	D11
2323	C12
2324	C12
2327	B12
2328	D12
2329	C13
2330	C13
2331	B13
2332	D13
2333	B14
2334	D14
2335	B15
2336	D15
2337	G9
2338	H9
2339	A12
2340	E8
2341	F8
2342	H6
2343	G10
2344	H10
2345	G12
2346	H12
2347	G12
2348	H12
2349	G13
2350	H13
2351	H15
2352	G15
2353	F10
2354	F10
2355	F11
2356	E14
2357	C13
2358	G13
2359	H13
2360	B1
2361	B2
2362	H8
2363	H7
2364	F12
2365	E13
2366	D9
2367	B9
2400	H3
2401	H3
2402	H3
2403	H1
2405	G1
2501	B5
2502	D5
2503	E9
2504	F7
2505	F7
2506	F6
2507	G4
2508	G4
2509	F4
2510	G4
2511	F4
2512	H5
2513	F5
2514	C6
2515	C6
2516	E6
2517	B6
2518	D7
2519	B7
2520	D7
2521	B7
2522	D7
2523	B7
2524	E7
2525	A7
2526	E7
2527	A7
2528	E8
2529	B8
2530	H4
2531	F4
2532	D8
2533	C8
2534	E8
2535	A8
2536	G5
2537	C9
2538	D9
2539	B9
2540	D9
2541	B9
2542	D9
2543	A9
2544	E9
2545	B10
2546	D10
2547	B10
2548	D10
2549	C11
2550	C11
2551	B4
2552	C4
2553	B2
2554	B3
2555	C2
2556	D2
2557	E3
2558	E2
2559	E4
2560	E4
2561	D3
2562	G7
2563	F2
2564	A2
2565	A2
2566	A1
2567	B7
2568	G1
2569	F2
2570	G4
2572	A2
2573	A2
2574	A2
2575	C8
2576	C8
2577	G7
2578	A5
2579	D4
2580	D8
2581	H2
2582	E6
2583	B5
2584	E7
2585	A7
2586	D9
2587	B9
2588	E1
2589	F1
2590	E9
2591	F5
2592	G5
2594	G5
2595	C5
2596	C5
2597	F14
3251	E4
3321	C11
3322	C11
3325	B12
3326	D12
3328	E9
3329	B11
3330	D11
3331	C12
3332	C12
3333	B13
3334	D13
3335	B13
3336	D13
3337	B14
3338	D14
3339	B14
3340	D14
3341	C14
3342	C14
3343	G9
3344	H9
3345	G10
3346	H10
3347	G12
3348	H12
3349	G12
3350	H12
3351	G12
3352	H12
3353	F12
3354	H12
3355	H14
3356	G14
3357	H14
3358	G14
3359	H14
3360	H14
3361	F11
3362	F11
3363	F11
3364	E11
3365	G12
3366	G12
3367	G13
3368	G13
3369	G13
3370	F14
3371	F14
3372	C13
3373	F10
3378	B14
3379	A12
3380	A12
3381	E14
3382	E14
3383	E12
3384	E12
3385	F13
3386	E13
3387	H8
3388	H7
3390	D4
3391	B6
3392	E6
3400	G3
3401	G3
3402	G3
3403	G3
3404	G2
3405	G2
3406	G2
3407	G2
3409	G1
3410	G1
3411	G6
3412	G6
3413	G6
3500	A5
3501	F5
3502	H5
3503	B7
3504	D7
3505	B6
3506	D6
3507	B7
3508	D7
3509	B6
3510	E6
3511	A6
3512	F6
3513	A6
3514	E6
3515	A6
3516	E6
3517	A4
3518	C8
3519	C8
3520	E8
3521	A8
3522	E8
3523	A8
3524	D8
3525	B8
3526	D8
3527	C8
3528	E8
3529	B8
3530	D9
3531	C9
3532	D9
3533	C9
3534	D9
3535	B9
3536	D9
3537	B9
3538	D10
3539	B10
3540	D10
3541	B10
3542	H2
3543	B10
3544	D10
3545	A10
3546	E9
3547	A10
3548	E10
3549	B11
3550	E11
3551	F4
3552	H4
3553	F4
3554	H4
3556	C5
3557	A5
3558	C5
3559	A5
3560	C5
3561	A5
3562	A3
3563	A3
3564	D5
3565	B5
3566	C3
3567	B3
3568	C4
3569	B4
3570	C3
3571	C3
3572	H5
3573	E5
3574	D3
3575	D3
3576	E3
3577	D3
3579	D4
3580	E3
3581	E3
3582	E3
3583	E3
3584	G7
3585	G7
3586	G5
3587	G4
3588	G5
3589	A7
3590	E7
3591	A3
3592	D6
3593	A2
3594	A2
3595	B6
3596	H5
3597	F5
3598	C10
3599	C10
3601	A2
3602	A2
3603	C8
3604	D8
3605	A7
3606	E7
3607	C8
3608	C8
3614	C6
3615	C6
3616	E14
3617	G9
3618	H9
4503	B1
4504	B1
4506	B1
4507	C1
5501	E2
5502	C13
5503	G12
5504	G12
5505	H12
5506	H12
5507	H8
5508	F10
5509	C1
6255	E2
6321	G12
6322	H12
6323	G12
6324	H12
6325	F12
6326	E10
6327	F11
6328	E11
6329	F12
6330	F1
6502	G8
6549	A10
6550	E10
6551	E4
6552	E14
7320	C11
7321	C11
7322	B14
7323	C14
7329	E11
7330	F11
7331	E12
7332	E13
7333	F13
7391	F11
7400	F1
7401	G6
7402	H2
7501	A3
7503	B5
7504	C5
7505	F5
7506	H5
7507	F5
7508	H5
7530	C7
7537	B8
7538	D8
7539	A6
7540	E6
7541	A7
7542	F7
7543	A8
7544	E8
7545	A9
7546	E9
7547	B9
7548	D9
7549	A10
7550	D10
7554-A	B13
7554-B	C13
7556	G7
9210	F9
9214	C1
9215	E13
9502	H2
9509	E2

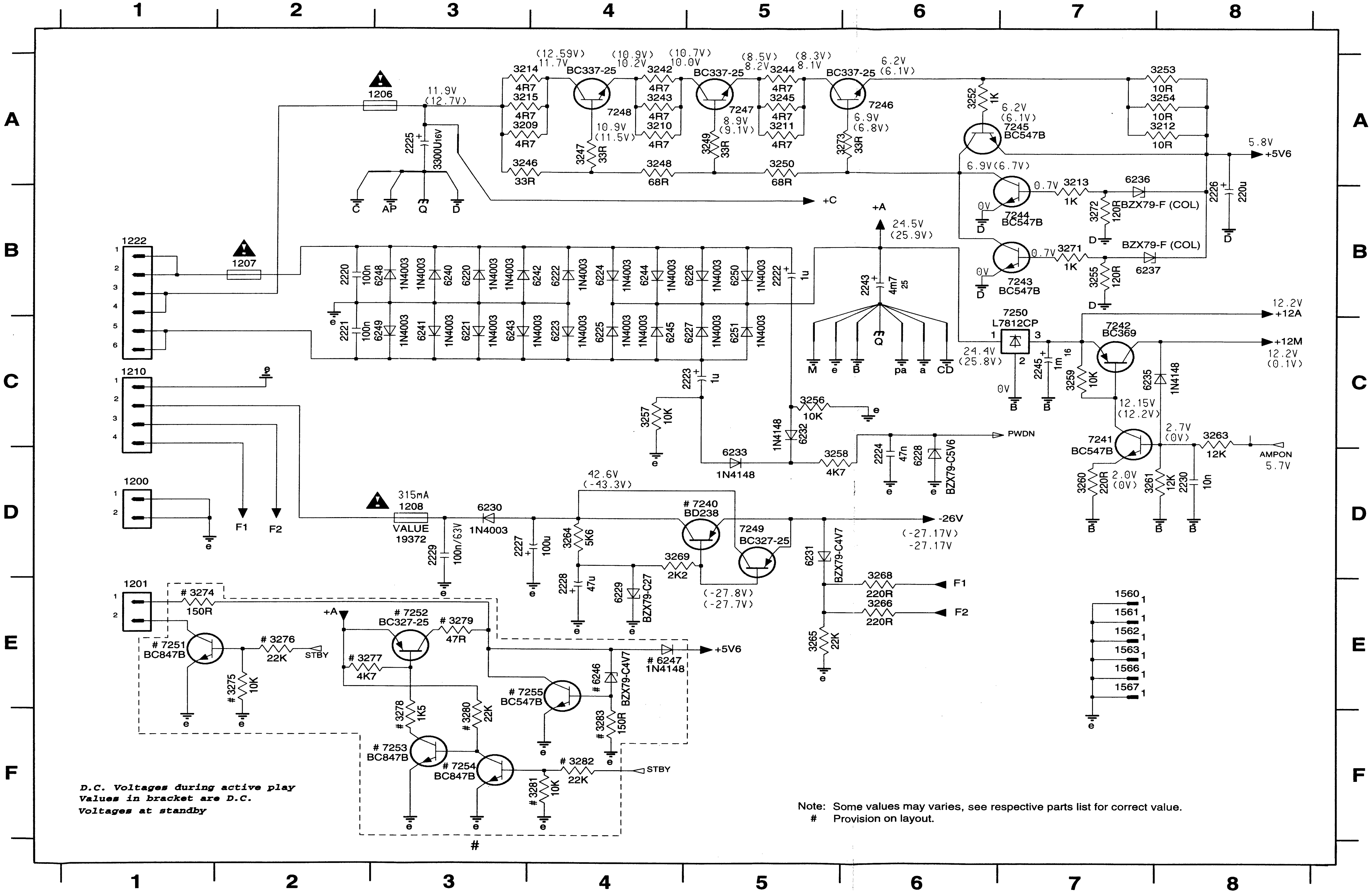

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
FROM AUX
SOURCE SELECTOR AND BUFFER AMP
7501
HEF4052BT
LOGIC
SOUND PROCESSOR
POWER AMP & MUTING
7554-A NJM4556AM
7554-B NJM4556AM
TO TAPE MOTOR
TO MTF
TO ETF
TO TUNER
TO FRONT
TO CDC3
TO CD-SL
7530 HEF4069BT
PROTECTION CIRCUIT
HEF4094BT
7402
VOL. CONTROL
HEAT SINK
7391 AN7125
SPEAKER LEFT
SPEAKER RIGHT
metric surround
YKC21-3416
1325
BDW94C
BZX79-C18
BZX79-C3V3
TO FRONT

Note: Some values may varies, see respective parts list for correct value.

- ^ For set with CD-SL
- # Provision on layout
- Δ For set wth Karaoke
- ▲ For set without Karaoke
- • For ETF only

D.C. Voltages during active play
Values in bracket are D.C.
Voltages at standby

CIRCUIT DIAGRAM - POWER SUPPLY PART


1
2
3
4
5
6
7
8
A
B
C
D
E
F
1206
11.9V
(12.7V)
2225
3300U16V
C
AP
Q
D
3214
3215
3209
4R7
3246
33R
(12.59V)
11.7V
BC337-25
7248
10.9V
(11.5V)
3247
33R
(10.9V)
10.2V
3242
3243
3210
3248
68R
(10.7V)
10.0V
BC337-25
7247
8.9V
(9.1V)
3249
33R
(8.5V)
8.2V
3244
3245
3211
(8.3V)
8.1V
3250
68R
BC337-25
7246
6.2V
(6.1V)
6.9V
(6.8V)
3273
33R
+C
3252
1K
6.2V
(6.1V)
7245
BC547B
3253
10R
3254
10R
3212
10R
5.8V
+5V6
6.9V(6.7V)
0V
7244
BC547B
0.7V
3213
1K
6236
3272
120R
BZX79-F (COL)
2226
220u
7243
BC547B
3271
1K
3255
120R
6237
1222
1207
+A
24.5V
(25.9V)
2220
100n
6248
1N4003
6240
6220
6242
6222
6224
6244
6226
6250
2222
1u
2221
6249
6241
6221
6243
6223
6225
6245
6227
6251
2243
4m7
25
M
e
B
pa
a
CD
7250
L7812CP
24.4V
(25.8V)
2245
1m
16
12.2V
+12A
7242
BC369
+12M
12.2V
(0.1V)
3259
10K
6235
1N4148
12.15V
(12.2V)
7241
BC547B
2.7V
(0V)
3263
12K
AMPON
5.7V
3260
220R
2.0V
(0V)
3261
12K
2230
10n
1210
2223
1u
3257
10K
3256
10K
6232
1N4148
6233
1N4148
3258
4K7
2224
47n
6228
BZX79-C5V6
PWDN
1200
F1
F2
315mA
1208
VALUE
19372
2229
100n/63V
6230
1N4003
2227
100u
42.6V
(-43.3V)
3264
5K6
# 7240
BD238
7249
BC327-25
3269
2K2
(-27.8V)
(-27.7V)
2228
47u
6229
BZX79-C27
-26V
(-27.17V)
-27.17V
6231
BZX79-C4V7
3268
220R
3266
220R
3265
22K
1560
1561
1562
1563
1566
1567
1201
# 3274
150R
# 7251
BC847B
# 3276
22K
STBY
# 3275
10K
+A
# 7252
BC327-25
# 3279
47R
# 3277
4K7
# 6247
1N4148
+5V6
# 7255
BC547B
# 6246
BZX79-C4V7
# 3278
1K5
# 3280
22K
# 3283
150R
# 7253
BC847B
# 7254
BC847B
# 3281
10K
# 3282
22K
STBY
#

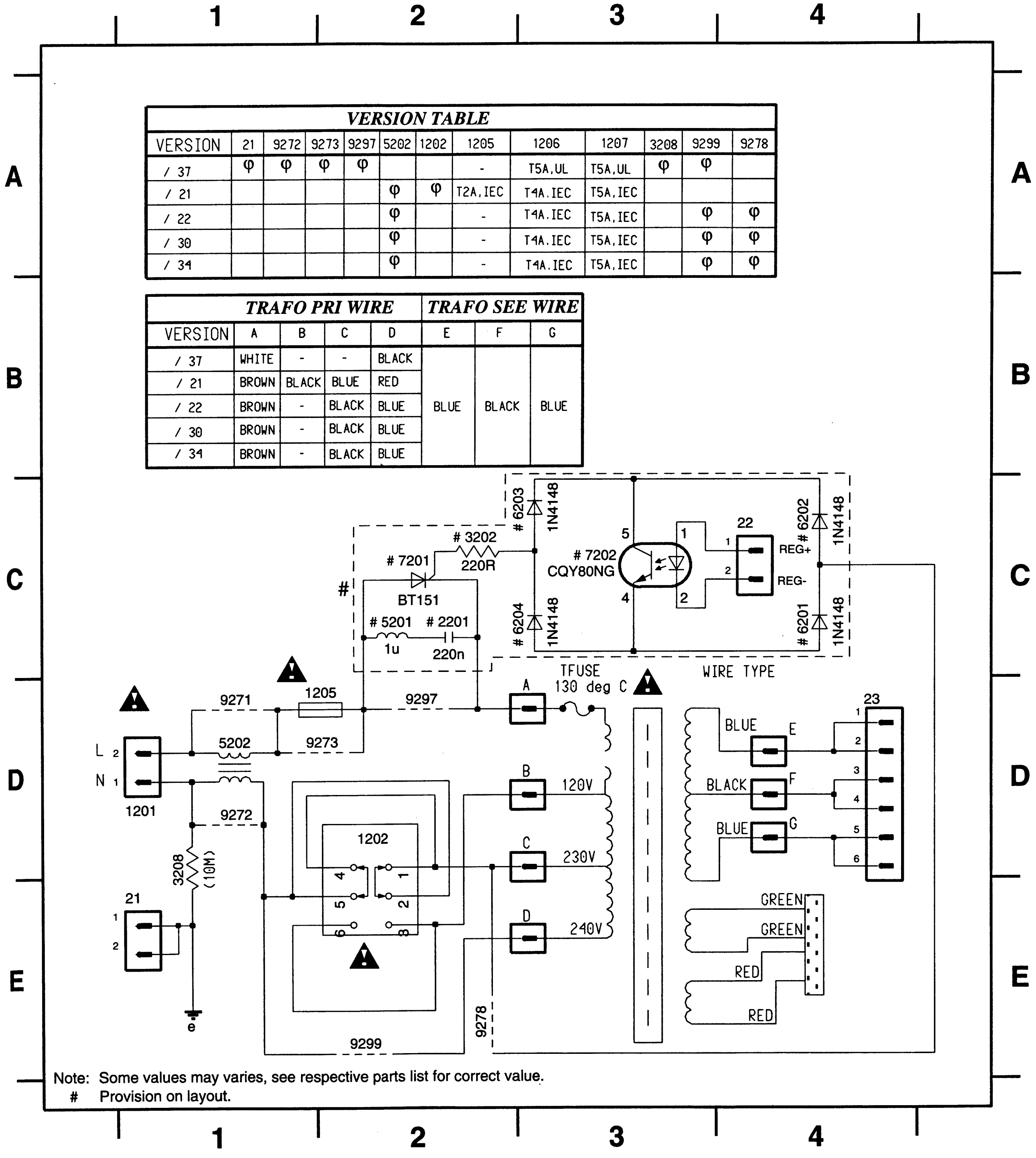
D.C. Voltages during active play
Values in bracket are D.C.
Voltages at standby

Note: Some values may varies, see respective parts list for correct value.
# Provision on layout.

1200	D1
1201	E1
1206	A3
1207	B2
1208	D3
1210	C1
1222	B1
1560	E7
1561	E7
1562	E7
1563	E7
1566	E7
1567	E7
2220	B2
2221	C2
2222	B5
2223	C5
2224	D6
2225	A3
2226	B8
2227	D3
2228	E4
2229	D3
2230	D8
2243	B6
2245	C7
3209	A3
3210	A4
3211	A5
3212	A8
3213	A7
3214	A3
3215	A3
3242	A4
3243	A4
3244	A5
3245	A5
3246	A3
3247	A4
3248	A4
3249	A5
3250	A5
3252	A6
3253	A8
3254	A8
3255	B7
3256	C5
3257	C4
3258	D5
3259	C7
3260	D7
3261	D7
3263	C8
3264	D4
3265	E5
3266	E6
3268	E6
3269	D4
3271	B7
3272	B7
3273	A6
3274	E1
3275	E2
3276	E2
3277	E2
3278	F3
3279	E3
3280	F3
3281	F4
3282	F4
3283	F4
6220	B3
6221	C3
6222	B4
6223	C4
6224	B4
6225	C4
6226	B5
6227	C5
6228	D6
6229	E4
6230	D3
6231	D5
6232	C5
6233	D5
6235	C7
6236	A7
6237	B7
6240	B3
6241	C3
6242	B4
6243	C3
6244	B4
6245	C4
6246	E4
6247	E4
6248	B3
6249	C3
6250	B5
6251	C5
7240	D4
7241	C7
7242	C7
7243	B7
7244	B7
7245	A7
7246	A6
7247	A5
7248	A4
7249	D5
7250	B7
7251	E1
7252	E3
7253	F3
7254	F3
7255	E4

CIRCUIT DIAGRAM - TRANSFORMER PRIMARY PART

21 E1	23 D4	1202 D2	2201 C2	3208 D1	5202 D1	6202 C4	6204 C3	7202 C3	9272 D1	9278 E2	9299 E2
22 C4	1201 D1	1205 D2	3202 C2	5201 C2	6201 C4	6203 C3	7201 C2	9271 D1	9273 D2	9297 D2	


1
2
3
4
A
B
C
D
E
L 2
N 1
1201
9271
5202
9273
9272
1205
9297
3208
(10M)
21
1
2
e
1202
4
5
6
1
2
3
#
# 7201
BT151
# 3202
220R
# 5201
1u
# 2201
220n
# 6203
1N4148
# 6204
1N4148
# 7202
CQY80NG
5
4
1
2
22
REG+
REG-
# 6202
1N4148
# 6201
1N4148
TFUSE
130 deg C
WIRE TYPE
A
B
120V
C
230V
D
240V
BLUE
E
BLACK
F
BLUE
G
23
1
2
3
4
5
6
GREEN
GREEN
RED
RED
9278
9299

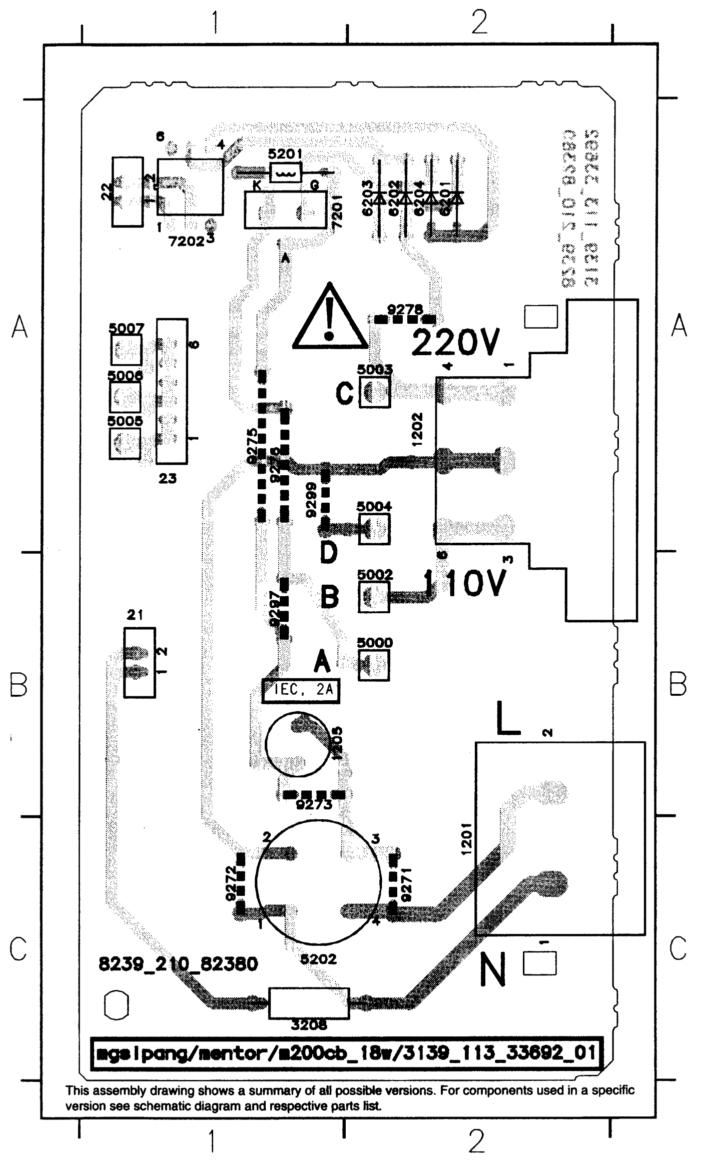
VERSION TABLE												
VERSION	21	9272	9273	9297	5202	1202	1205	1206	1207	3208	9299	9278
/ 37	φ	φ	φ	φ			-	T5A,UL	T5A,UL	φ	φ	
/ 21					φ	φ	T2A,IEC	T4A.IEC	T5A,IEC			
/ 22					φ		-	T4A.IEC	T5A,IEC		φ	φ
/ 30					φ		-	T4A.IEC	T5A,IEC		φ	φ
/ 34					φ		-	T4A.IEC	T5A,IEC		φ	φ

	TRAFO PRI WIRE				TRAFO SEE WIRE		
VERSION	A	B	C	D	E	F	G
/ 37	WHITE	-	-	BLACK	BLUE	BLACK	BLUE
/ 21	BROWN	BLACK	BLUE	RED			
/ 22	BROWN	-	BLACK	BLUE			
/ 30	BROWN	-	BLACK	BLUE			
/ 34	BROWN	-	BLACK	BLUE			

Note: Some values may vary, see respective parts list for correct value.
# Provision on layout.

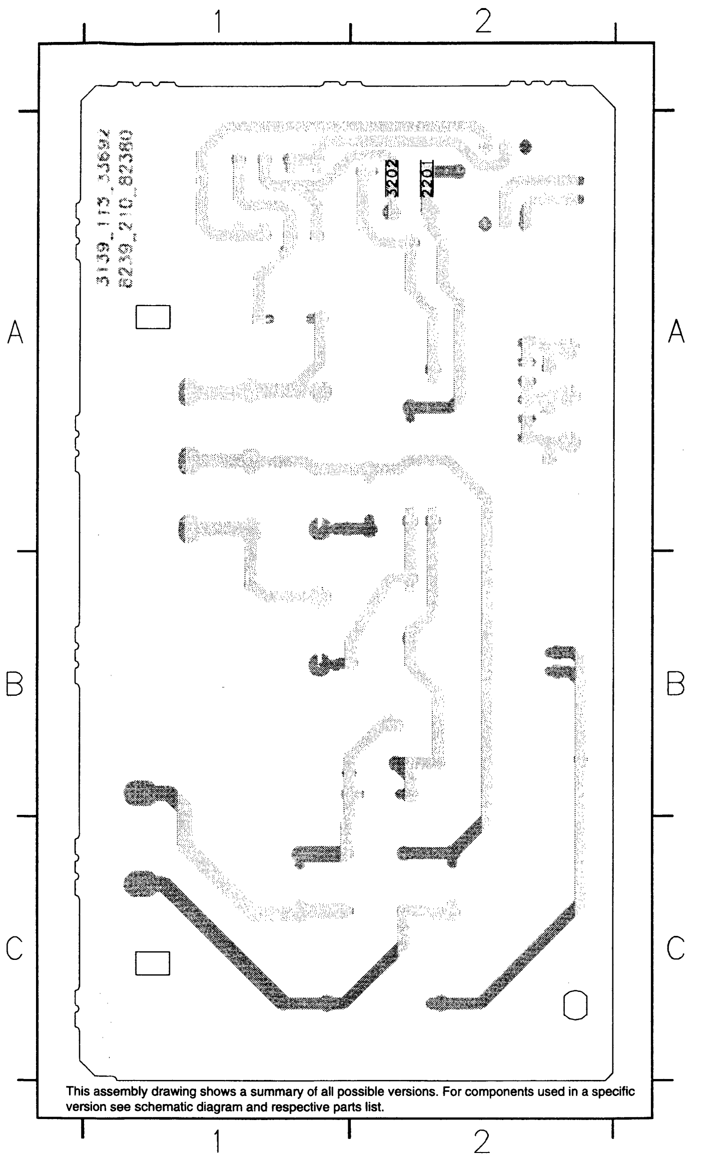
COMPONENT & CHIP LAYOUT - TRANSFORMER PRIMARY

21 B1	1205 B1	5004 A2	5202 C1	7201 A1	9275 A1
22 A1	3208 C1	5005 A1	6201 A2	7202 A1	9276 A1
23 A1	5000 B2	5006 A1	6202 A2	9271 C2	9278 A2
1201 C2	5002 B2	5007 A1	6203 A2	9272 C1	9297 B1
1202 A2	5003 A2	5201 A1	6204 A2	9273 B1	9299 A1


1
2
A
B
C
22
5201
7202
7201
6203
6202
6204
6201
9278
220V
5007
5006
5005
23
5003
C
1202
9275
9299
5004
D
5002
B
110V
21
9297
A
5000
IEC, 2A
L
1205
9273
9272
9271
1201
8239_210_82380
5202
N
3208
mgslpang/mentor/m200cb_18w/3139_113_33692_01

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

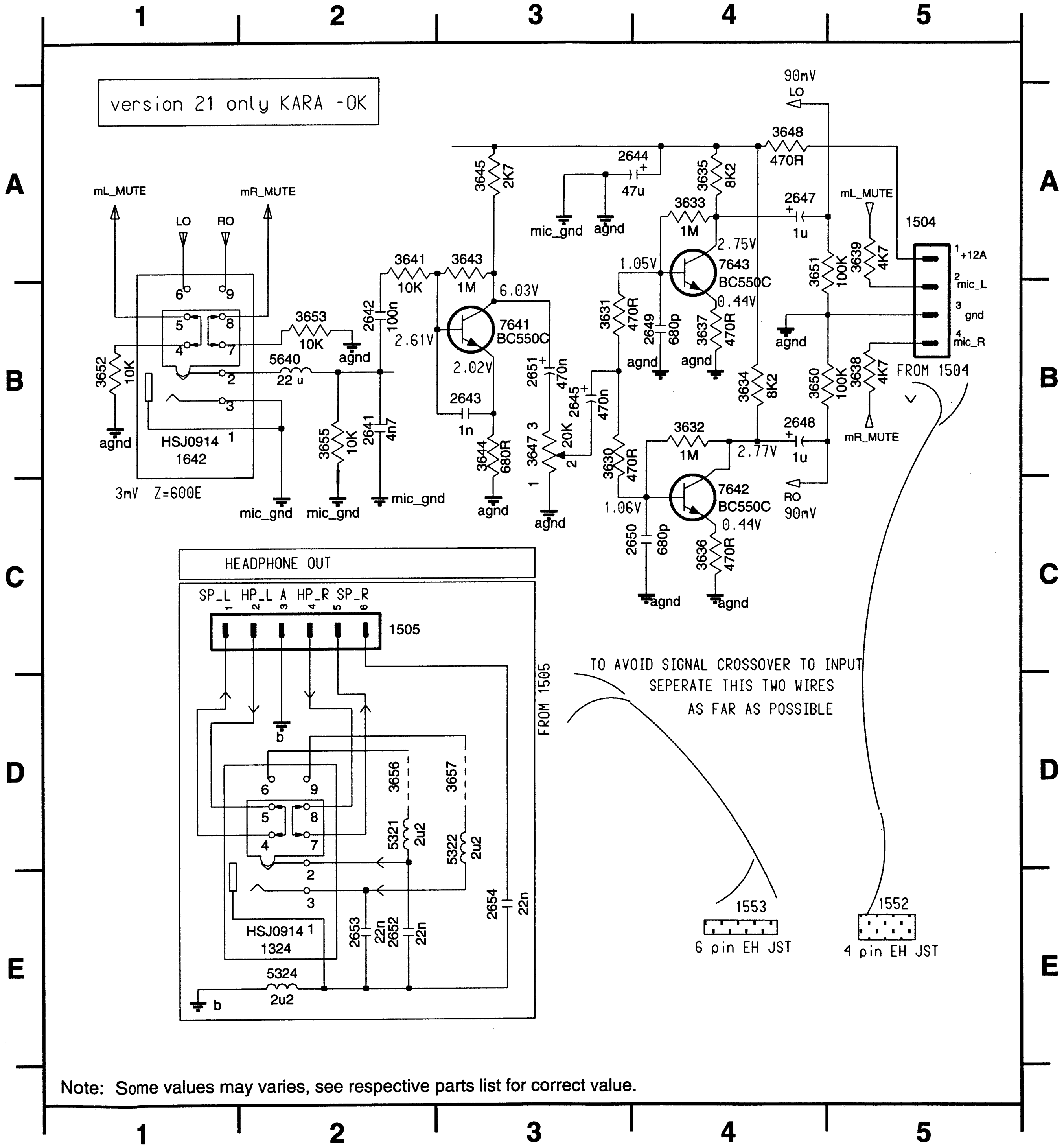
2201 A2   3202 A2


1
2
A
B
C
3139_113_33692
8239_210_82380
3202
2201

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KARAOKE & HEADPHONE PART - CIRCUIT DIAGRAM

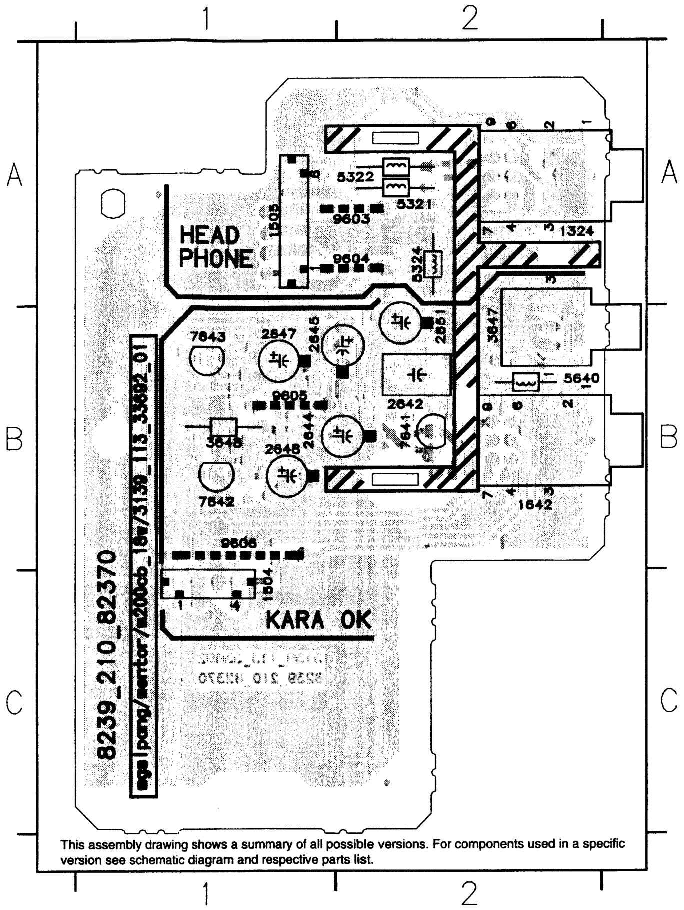
1324 E2	2641 B2	2645 B3	2650 C4	2654 E3	3633 A4	3637 B4	3643 A3	3648 A4	3653 B2	5321 D2	7641 B3
1504 A5	2642 B2	2647 A4	2651 B3	3630 B3	3634 B4	3638 B5	3644 B3	3650 B4	3655 B2	5322 D3	7642 C4
1505 C2	2643 B3	2648 B4	2652 E2	3631 B3	3635 A4	3639 A5	3645 A3	3651 A4	3656 D2	5324 E2	7643 A4
1642 B1	2644 A4	2649 B4	2653 E2	3632 B4	3636 C4	3641 A2	3647 B3	3652 B1	3657 D3	5640 B2	


1
2
3
4
5
A
B
C
D
E
version 21 only KARA -OK
mL_MUTE
mR_MUTE
LO
RO
agnd
3652 10K
HSJ0914 1642
3mV Z=600E
3653 10K
5640 22 u
3655 10K
2641 4n7
2642 100n
mic_gnd
3641 10K
3643 1M
3645 2K7
2.61V
6.03V
7641 BC550C
2.02V
2643 1n
3644 680R
3647 20K
2651 470n
2645 470n
2644 47u
3635 8K2
3633 1M
2.75V
1.05V
7643 BC550C
0.44V
3631 470R
2649 680p
3637 470R
3648 470R
90mV
2647 1u
3651 100K
3639 4K7
1504
+12A
mic_L
gnd
mic_R
FROM 1504
3634 8K2
3650 100K
3638 4K7
2648 1u
3632 1M
2.77V
3630 470R
1.06V
7642 BC550C
0.44V
2650 680p
3636 470R
HEADPHONE OUT
SP_L HP_L A HP_R SP_R
1505
FROM 1505
3656
3657
5321 2u2
5322 2u2
HSJ0914 1324
2653 22n
2652 22n
2654 22n
5324 2u2
b
TO AVOID SIGNAL CROSSOVER TO INPUT
SEPERATE THIS TWO WIRES
AS FAR AS POSSIBLE
1553
6 pin EH JST
1552
4 pin EH JST

Note: Some values may varies, see respective parts list for correct value.

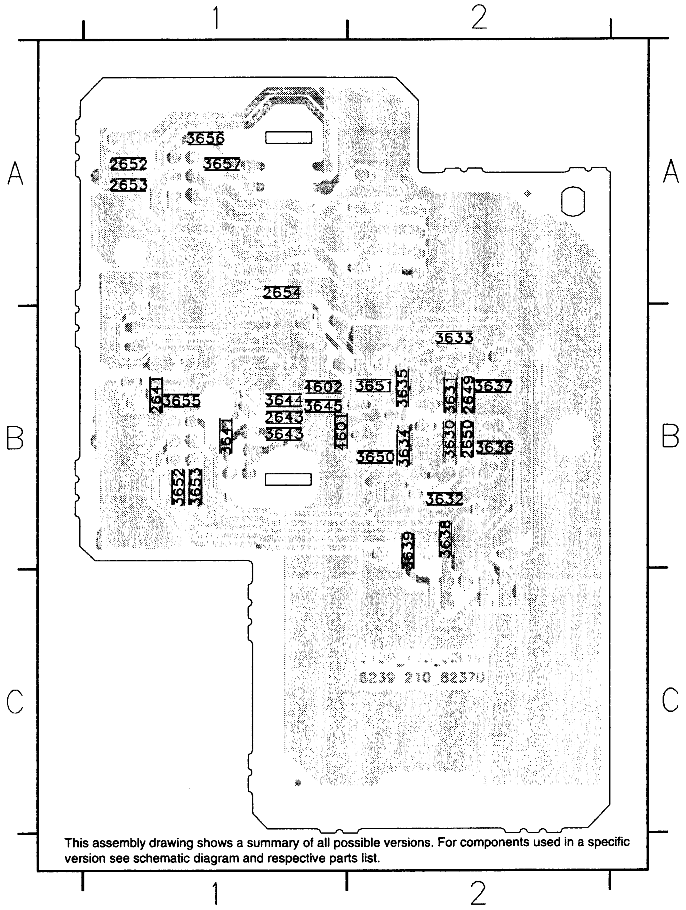
KARAOKE & HEADPHONE PART - COMPONENT & CHIP LAYOUT

1324 A2	2642 B2	2648 B1	5321 A2	7641 B2	9604 A2
1504 C1	2644 B1	2651 B2	5322 A2	7642 B1	9605 B1
1505 A1	2645 B1	3647 B2	5324 A2	7643 B1	9606 B1
1642 B2	2647 B1	3648 B1	5640 B2	9603 A2	


1
2
A
B
C
HEAD PHONE
1505
5322
5321
9603
9604
5324
1324
7643
2647
2645
3647
5640
9605
2644
2642
3648
2648
7641
7642
1642
9606
1504
KARA OK
8239_210_82370

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2641 B1	2653 A1	3633 B2	3638 B2	3645 B1	3655 B1
2643 B1	2654 A1	3634 B2	3639 B2	3650 B2	3656 A1
2649 B2	3630 B2	3635 B2	3641 B1	3651 B2	3657 A1
2650 B2	3631 B2	3636 B2	3643 B1	3652 B1	4601 B1
2652 A1	3632 B2	3637 B2	3644 B1	3653 B1	4602 B1

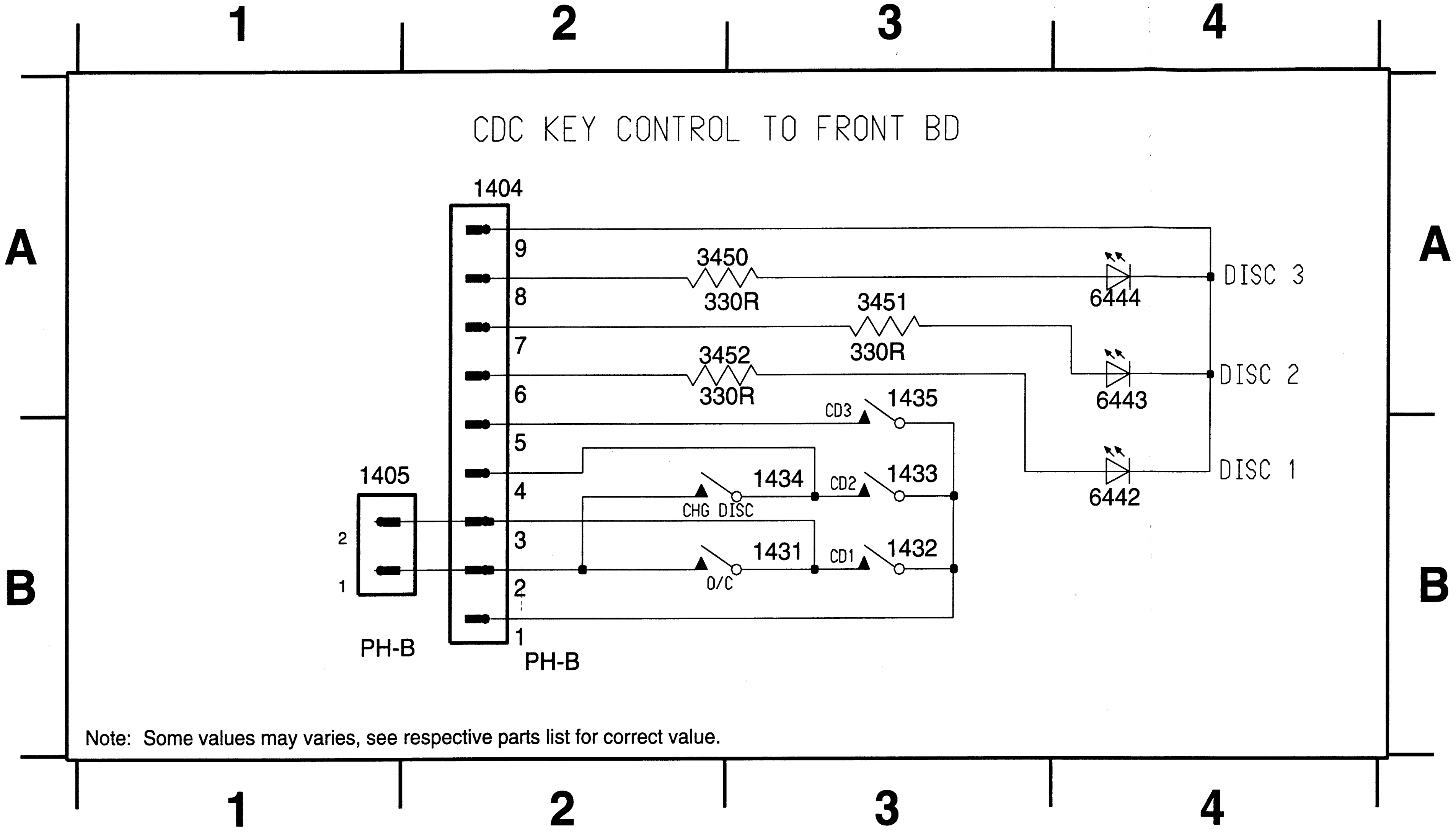

1
2
A
B
C
3656
2652
3657
2653
2654
3633
4602
3651
3655
3644
3645
3643
4601
3650
3634
3630
3636
3637
3652
3653
3632
3639
3638
8239 210 82370

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CDC KEY PART

1404	A2
1405	B1
1431	B3
1432	B3
1433	B3
1434	B3
1435	A3
3450	A2
3451	A3
3452	A2
6442	B4
6443	A4
6444	A4

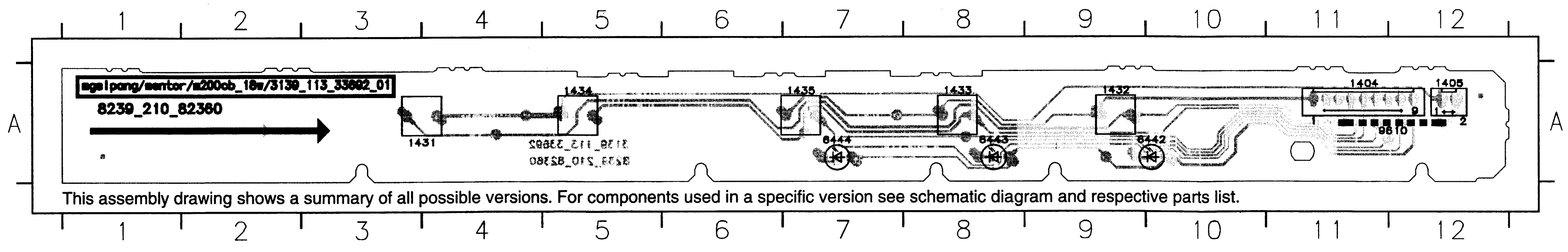
CIRCUIT DIAGRAM - CDC KEY PART


1
2
3
4
A
B
CDC KEY CONTROL TO FRONT BD
1404
9
8
7
6
5
4
3
2
1
PH-B
1405
2
1
PH-B
3450
330R
3451
330R
3452
330R
1435
CD3
1434
CHG DISC
1433
CD2
1431
O/C
1432
CD1
6444
6443
6442
DISC 3
DISC 2
DISC 1

Note: Some values may varies, see respective parts list for correct value.

1404	A11
1405	A12
1431	A3
1432	A9
1433	A8
1434	A5
1435	A7
6442	A10
6443	A8
6444	A7
9610	A12

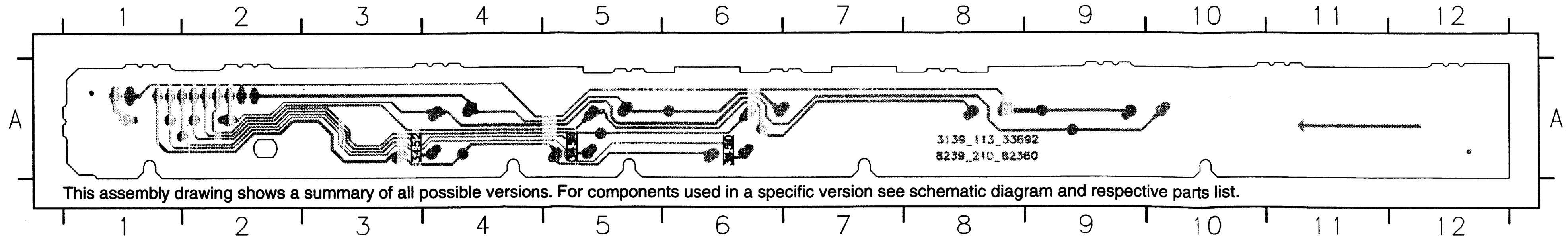
COMPONENT LAYOUT - CDC KEY


1
2
3
4
5
6
7
8
9
10
11
12
A
mgsipang/mentor/m200cb_18w/3139_113_33692_01
8239_210_82360
1431
1434
3139_113_33692
8239_210_82360
1435
1433
1432
6444
6443
6442
1404
1405
9610

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3450	A6
3451	A5
3452	A3

CHIP LAYOUT - CDC KEY


1
2
3
4
5
6
7
8
9
10
11
12
A
3139_113_33692
8239_210_82360

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

MISCELLANEOUS

1201	4822 265 31015	⚠	Mains Socket
1201	4822 265 31016	⚠	Mains Socket for /37
1202	4822 272 10269	⚠	Voltage selector for /21/21M
1205	4822 071 52002	⚠	Fuse T2A 250V
1206	4822 071 54002	⚠	Fuse T4A 250V
1206	4822 071 55002	⚠	Fuse T5A 250V for /37
1207	4822 071 55002	⚠	Fuse T5A 250V
1208	4822 071 53151	⚠	Fuse T315mA 250V
1322	4822 267 31176		Loudspeaker Socket L/R
1323	4822 265 10463		Matrix Surround Socket
1324	4822 267 40898		Headphone Socket
1325	4822 267 31729		Cinch Socket - Sub-Woofer out
1431	4822 276 13114		Tact Switch
1432	4822 276 13114		Tact Switch
1433	4822 276 13114		Tact Switch
1434	4822 276 13114		Tact Switch
1435	4822 276 13114		Tact Switch
1507	4822 265 20553		Aux Socket
1508	4822 267 10738		Flex Socket 13 pins
1509	4822 265 10981		Flex Socket 15 pins
1642	4822 267 40898		Mic-in Socket

CAPACITORS

2220	5322 121 42386	100nF 5% 63V
2221	5322 121 42386	100nF 5% 63V
2222	4822 124 40242	1µF 20% 63V
2223	4822 124 40242	1µF 20% 63V
2224	4822 121 43526	47nF 5% 250V
2225	4822 124 40784	3300µF 20% 16V
2226	4822 124 22263	220µF 20% 25V
2227	4822 124 40255	100µF 20% 63V
2228	4822 124 41751	47µF 20% 50V
2229	5322 121 42386	100nF 5% 63V
2230	4822 122 33177	10nF 20% 50V
2243	4822 124 80563	4700µF 20% 35V
2245	4822 123 14024	1000µF 20% 16V
2321	5322 122 32531	100pF 5% 50V
2322	5322 122 32531	100pF 5% 50V
2323	4822 124 40242	1µF 20% 63V
2324	4822 124 40242	1µF 20% 63V
2327	5322 122 34099	470pF 10% 63V
2328	5322 122 34099	470pF 10% 63V
2331	5322 122 32659	33pF 5% 50V
2332	5322 122 32659	33pF 5% 50V
2333	4822 124 40433	47µF 20% 25V
2334	4822 124 40433	47µF 20% 25V
2335	5322 122 32531	100pF 5% 50V
2336	5322 122 32531	100pF 5% 50V
2337	4822 124 40246	4,7µF 20% 63V
2338	4822 124 40246	4,7µF 20% 63V
2339	4822 124 40433	47µF 20% 25V
2340	5322 126 10223	4,7nF 10% 63V
2341	4822 122 32535	680pF 10% 63V
2342	4822 124 81029	100µF 20% 25V
2343	5322 122 32658	22pF 5% 50V
2344	5322 122 32658	22pF 5% 50V
2345	4822 126 10002	100nF 20% 25V
2346	4822 126 10002	100nF 20% 25V
2347	4822 121 42408	220nF 5% 63V
2348	4822 121 42408	220nF 5% 63V
2349	4822 121 42408	220nF 5% 63V
2350	4822 121 42408	220nF 5% 63V
2351	4822 124 22263	220µF 20% 25V
2352	4822 124 22263	220µF 20% 25V
2353	4822 124 40246	4,7µF 20% 63V
2354	4822 124 81029	100µF 20% 25V
2355	4822 122 33175	2,2nF 20% 50V
2356	4822 124 40242	1µF 20% 63V
2357	4822 124 40433	47µF 20% 25V
2358	4822 122 33177	10nF 20% 50V
2359	4822 122 33177	10nF 20% 50V
2360	5322 122 32654	22nF 10% 63V
2361	5322 122 32654	22nF 10% 63V
2362	4822 122 32535	680pF 10% 63V
2363	4822 122 32535	680pF 10% 63V
2364	4822 122 32535	680pF 10% 63V
2365	4822 122 32535	680pF 10% 63V
2366	4822 126 10326	180pF 5% 63V
2367	4822 126 10326	180pF 5% 63V
2400	5322 122 32531	100pF 5% 50V
2401	5322 122 32531	100pF 5% 50V
2402	5322 122 34123	1nF 10% 50V
2403	4822 126 10002	100nF 20% 25V
2405	4822 124 81151	22µF 50V
2501	4822 122 32535	680pF 10% 63V
2502	4822 122 32535	680pF 10% 63V
2503	4822 122 33177	10nF 20% 50V
2504	4822 124 41584	100µF 20% 10V
2505	4822 124 40433	47µF 20% 25V
2506	4822 124 40433	47µF 20% 25V
2507	4822 124 41584	100µF 20% 10V
2508	4822 124 40242	1µF 20% 63V
2509	4822 124 40242	1µF 20% 63V
2510	5322 122 34099	470pF 10% 63V
2511	5322 122 34099	470pF 10% 63V
2512	5322 122 34099	470pF 10% 63V
2513	5322 122 34099	470pF 10% 63V
2514	4822 126 13836	1µF 16V
2515	4822 126 13836	1µF 16V
2516	4822 126 13296	100nF 10% 16V
2517	4822 126 13296	100nF 10% 16V
2518	5322 122 34099	470pF 10% 63V
2519	5322 122 34099	470pF 10% 63V
2520	5322 122 34123	1nF 10% 50V
2521	5322 122 34123	1nF 10% 50V
2522	5322 126 10223	4,7nF 10% 63V
2523	5322 126 10223	4,7nF 10% 63V
2524	5322 122 32531	100pF 5% 50V
2525	5322 122 32531	100pF 5% 50V
2526	4822 126 13296	100nF 10% 16V
2527	4822 126 13296	100nF 10% 16V
2528	4822 126 13296	100nF 10% 16V
2529	4822 126 13296	100nF 10% 16V
2530	4822 126 10326	180pF 5% 63V
2531	4822 126 10326	180pF 5% 63V
2532	5322 116 80853	560pF 5% 63V
2533	5322 116 80853	560pF 5% 63V
2534	4822 126 13296	100nF 10% 16V
2535	4822 126 13296	100nF 10% 16V
2536	4822 124 80195	470µF 20% 10V
2537	4822 126 13751	47nF 10% 63V
2538	4822 126 13751	47nF 10% 63V
2539	4822 126 13296	100nF 10% 16V
2540	4822 126 13296	100nF 10% 16V
2541	4822 126 13751	47nF 10% 63V
2542	4822 126 13751	47nF 10% 63V
2543	4822 126 13296	100nF 10% 16V
2544	4822 126 13296	100nF 10% 16V
2545	4822 126 13296	100nF 10% 16V
2546	4822 126 13296	100nF 10% 16V
2547	4822 126 13869	470nF +80/-20% 16V
2548	4822 126 13869	470nF +80/-20% 16V
2549	4822 124 40242	1µF 20% 63V
2550	4822 124 40242	1µF 20% 63V
2551	4822 124 40242	1µF 20% 63V
2552	4822 124 40242	1µF 20% 63V
2553	4822 122 33805	330pF 10% 63V
2554	4822 122 33805	330pF 10% 63V
2555	4822 122 33805	330pF 10% 63V
2556	4822 122 33805	330pF 10% 63V
2559	4822 124 40242	1µF 20% 63V
2560	4822 124 40242	1µF 20% 63V
2561	4822 126 13751	47nF 10% 63V
2562	4822 126 10002	100nF 20% 25V
2563	5322 122 32531	100pF 5% 50V
2564	4822 122 33805	330pF 10% 63V
2565	4822 122 33805	330pF 10% 63V
2566	4822 126 10002	100nF 20% 25V
2567	4822 122 33177	10nF 20% 50V
2568	4822 126 13694	68pF 1% 63V
2569	4822 126 13694	68pF 1% 63V
2570	4822 124 41579	10µF 20% 50V
2572	4822 126 10002	100nF 20% 25V
2573	4822 124 40246	4,7µF 20% 63V
2574	4822 124 40246	4,7µF 20% 63V
2575	4822 126 13692	47pF 1% 63V
2576	4822 126 13692	47pF 1% 63V
2577	4822 124 80195	470µF 20% 10V
2578	4822 124 81029	100µF 20% 25V
2579	4822 124 40433	47µF 20% 25V
2580	4822 124 41584	100µF 20% 10V
2581	4822 124 41584	100µF 20% 10V
2582	4822 126 13296	100nF 10% 16V
2583	4822 126 13296	100nF 10% 16V
2584	4822 126 13296	100nF 10% 16V
2585	4822 126 13296	100nF 10% 16V
2586	4822 126 13296	100nF 10% 16V
2587	4822 126 13296	100nF 10% 16V
2588	4822 122 33805	330pF 10% 63V
2589	4822 122 33805	330pF 10% 63V
2590	4822 124 40433	47µF 20% 25V
2591	4822 122 32535	680pF 10% 63V
2592	4822 122 32535	680pF 10% 63V
2594	4822 122 32535	680pF 10% 63V
2597	5322 122 31865	1,5nF 10% 63V
2641	5322 126 10223	4,7nF 10% 63V
2642	5322 121 42386	100nF 5% 63V
2643	5322 122 34123	1nF 10% 50V
2644	4822 124 40433	47µF 20% 25V
2645	4822 124 41407	0,47µF 20% 63V
2647	4822 124 40242	1µF 20% 63V
2648	4822 124 40242	1µF 20% 63V
2649	4822 122 32535	680pF 10% 63V
2650	4822 122 32535	680pF 10% 63V
2651	4822 124 41407	0,47µF 20% 63V
2652	5322 122 32654	22nF 10% 63V
2653	5322 122 32654	22nF 10% 63V
2654	5322 122 32654	22nF 10% 63V

RESISTORS

3208	4822 053 21106	10M 5% 0,5W
3209	4822 051 20478	4R7 5% 0,1W
3210	4822 051 20478	4R7 5% 0,1W
3211	4822 051 20478	4R7 5% 0,1W
3212	4822 051 20109	10R 5% 0,1W
3213	4822 051 10102	1k 2% 0,25W
3214	4822 051 20478	4R7 5% 0,1W
3215	4822 051 20478	4R7 5% 0,1W
3242	4822 051 20478	4R7 5% 0,1W
3243	4822 051 20478	4R7 5% 0,1W
3244	4822 051 20478	4R7 5% 0,1W
3245	4822 051 20478	4R7 5% 0,1W
3246	4822 116 52191	33R 5% 0,5W
3247	4822 051 20339	33R 5% 0,1W

RESISTORS

3248	4822 116 52199	68R 5% 0,5W
3249	4822 051 20339	33R 5% 0,1W
3250	4822 116 52199	68R 5% 0,5W
3251	4822 117 10833	10k 1% 0,1W
3252	4822 051 10102	1k 2% 0,25W
3253	4822 051 20109	10R 5% 0,1W
3254	4822 051 20109	10R 5% 0,1W
3255	4822 051 20121	120R 5% 0,1W
3256	4822 116 83864	10k 5% 0,5W
3257	4822 116 83864	10k 5% 0,5W
3258	4822 116 52283	4k7 5% 0,5W
3259	4822 117 10833	10k 1% 0,1W
3260	4822 117 11503	220R 1% 0.1W
3261	4822 117 11383	12k 1% 0,1W
3263	4822 117 11383	12k 1% 0,1W
3264	4822 116 52289	5k6 5% 0,5W
3265	4822 116 52257	22k 5% 0,5W
3266	4822 116 83872	220R 5% 0,5W
3268	4822 116 83872	220R 5% 0,5W
3269	4822 116 52256	2k2 5% 0,5W
3271	4822 051 10102	1k 2% 0,25W
3272	4822 051 20121	120R 5% 0,1W
3273	4822 051 20339	33R 5% 0,1W
3321	4822 051 20332	3k3 5% 0,1W
3322	4822 051 20332	3k3 5% 0,1W
3325	4822 051 20104	100k 5% 0,1W
3326	4822 051 20104	100k 5% 0,1W
3328	4822 051 20472	4k7 5% 0,1W
3329	4822 051 20332	3k3 5% 0,1W
3330	4822 051 20332	3k3 5% 0,1W
3331	4822 117 11383	12k 1% 0,1W
3332	4822 117 11383	12k 1% 0,1W
3333	4822 051 20472	4k7 5% 0,1W
3334	4822 051 20472	4k7 5% 0,1W
3335	4822 117 11149	82k 1% 0,1W
3336	4822 117 11149	82k 1% 0,1W
3337	4822 051 20479	47R 5% 0,1W
3338	4822 051 20479	47R 5% 0,1W
3339	4822 051 20689	68R 5% 0,1W
3340	4822 051 20689	68R 5% 0,1W
3341	4822 051 10102	1k 2% 0,25W
3342	4822 051 10102	1k 2% 0,25W
3343	4822 051 20154	150k 5% 0,1W
3344	4822 051 20154	150k 5% 0,1W
3345	4822 117 11507	6k8 1% 0,1W
3346	4822 117 11507	6k8 1% 0,1W
3347	4822 117 10833	10k 1% 0,1W
3348	4822 117 10833	10k 1% 0,1W
3349	4822 117 10833	10k 1% 0,1W
3350	4822 117 10833	10k 1% 0,1W
3351	4822 051 20228	2R2 5% 0,1W

3352	4822 051 20228	2R2 5% 0,1W
3353	4822 051 20228	2R2 5% 0,1W
3354	4822 051 20228	2R2 5% 0,1W
3355	4822 116 83872	220R 5% 0,5W
3356	4822 116 83872	220R 5% 0,5W
3357	4822 116 83872	220R 5% 0,5W
3358	4822 116 83872	220R 5% 0,5W
3359	4822 116 83872	220R 5% 0,5W
3360	4822 116 83872	220R 5% 0,5W
3361	4822 116 52249	1k8 5% 0,5W
3362	4822 116 52249	1k8 5% 0,5W
3363	4822 116 52249	1k8 5% 0,5W
3364	4822 116 83883	470R 5% 0,5W
3365	4822 116 83872	220R 5% 0,5W
3366	4822 116 52283	4k7 5% 0,5W
3367	4822 117 10833	10k 1% 0,1W
3368	4822 117 10833	10k 1% 0,1W
3369	4822 117 10833	10k 1% 0,1W
3370	4822 117 10833	10k 1% 0,1W
3371	4822 117 11139	1k5 1% 0,1W
3372	4822 051 20109	10R 5% 0,1W
3373	4822 116 52219	330R 5% 0,5W
3378	4822 051 20475	4M7 5% 0,1W
3379	4822 051 20472	4k7 5% 0,1W
3380	4822 051 20392	3k9 5% 0,1W
3381	4822 116 52175	100R 5% 0,5W
3382	4822 051 20153	15k 5% 0,1W
3383	4822 051 20223	22k 5% 0,1W
3384	4822 051 20223	22k 5% 0,1W
3385	4822 117 10834	47k 1% 0,1W
3386	4822 117 10834	47k 1% 0,1W
3387	4822 051 20562	5k6 5% 0,1W
3388	4822 051 20562	5k6 5% 0,1W
3391	4822 051 20105	1M 5% 0,1W
3391	4822 116 83872	220R 5% 0,5W for /37
3392	4822 051 20105	1M 5% 0,1W
3392	4822 116 83872	220R 5% 0,5W for /37
3400	4822 117 11449	2k2 1% 0,1W
3401	4822 117 11449	2k2 1% 0,1W
3402	4822 117 11449	2k2 1% 0,1W
3403	4822 117 11449	2k2 1% 0,1W
3404	4822 117 11449	2k2 1% 0,1W
3405	4822 051 20471	470R 5% 0,1W
3406	4822 117 11449	2k2 1% 0,1W
3407	4822 117 11449	2k2 1% 0,1W
3409	4822 051 20562	5k6 5% 0,1W
3410	4822 051 20562	5k6 5% 0,1W
3411	4822 116 52175	100R 5% 0,5W
3412	4822 116 52175	100R 5% 0,5W
3413	4822 116 52175	100R 5% 0,5W
3450	4822 051 20331	330R 5% 0,1W

3451	4822 051 20331	330R 5% 0,1W
3452	4822 051 20331	330R 5% 0,1W
3500	4822 052 10339	33R 5% 0,33W
3501	4822 117 10834	47k 1% 0,1W
3502	4822 117 10834	47k 1% 0,1W
3503	4822 051 20104	100k 5% 0,1W
3504	4822 051 20104	100k 5% 0,1W
3505	4822 051 20104	100k 5% 0,1W
3506	4822 051 20104	100k 5% 0,1W
3507	4822 051 20683	68k 5% 0,1W
3508	4822 051 20683	68k 5% 0,1W
3509	4822 117 10834	47k 1% 0,1W
3510	4822 117 10834	47k 1% 0,1W
3511	4822 117 10834	47k 1% 0,1W
3512	4822 117 10834	47k 1% 0,1W
3513	4822 117 10834	47k 1% 0,1W
3514	4822 117 10834	47k 1% 0,1W
3515	4822 051 20683	68k 5% 0,1W
3516	4822 051 20683	68k 5% 0,1W
3517	4822 117 10833	10k 1% 0,1W
3518	4822 051 20104	100k 5% 0,1W
3519	4822 051 20104	100k 5% 0,1W
3520	4822 051 20223	22k 5% 0,1W
3521	4822 051 20223	22k 5% 0,1W
3522	4822 051 20105	1M 5% 0,1W
3523	4822 051 20105	1M 5% 0,1W
3524	4822 051 20104	100k 5% 0,1W
3525	4822 051 20104	100k 5% 0,1W
3526	4822 117 11148	56k 1% 0,1W
3527	4822 117 11148	56k 1% 0,1W
3528	4822 051 20333	33k 5% 0,1W
3529	4822 051 20333	33k 5% 0,1W
3530	4822 051 20104	100k 5% 0,1W
3531	4822 051 20104	100k 5% 0,1W
3532	4822 051 20223	22k 5% 0,1W
3533	4822 051 20223	22k 5% 0,1W
3534	4822 051 20184	180k 5% 0,1W
3535	4822 051 20184	180k 5% 0,1W
3536	4822 117 10834	47k 1% 0,1W
3537	4822 117 10834	47k 1% 0,1W
3538	4822 051 20224	220k 5% 0,1W
3539	4822 051 20224	220k 5% 0,1W
3540	4822 051 20474	470k 5% 0,1W
3541	4822 051 20474	470k 5% 0,1W
3542	4822 116 52176	10R 5% 0,5W
3543	4822 051 20104	100k 5% 0,1W
3544	4822 051 20104	100k 5% 0,1W
3545	4822 051 20104	100k 5% 0,1W
3546	4822 051 20104	100k 5% 0,1W
3547	4822 051 20334	330k 5% 0,1W
3548	4822 051 20334	330k 5% 0,1W

3549	4822 051 20104	100k 5% 0,1W
3550	4822 051 20104	100k 5% 0,1W
3551	4822 051 20228	2R2 5% 0,1W
3552	4822 051 20228	2R2 5% 0,1W
3553	4822 117 10834	47k 1% 0,1W
3554	4822 117 10834	47k 1% 0,1W
3556	4822 117 11507	6k8 1% 0,1W
3557	4822 117 11507	6k8 1% 0,1W
3558	4822 051 20225	2M2 5% 0,1W
3559	4822 051 20225	2M2 5% 0,1W
3560	4822 051 20471	470R 5% 0,1W
3561	4822 051 20471	470R 5% 0,1W
3562	4822 051 20153	15k 5% 0,1W
3563	4822 051 20153	15k 5% 0,1W
3564	4822 117 11503	220R 1% 0.1W
3565	4822 117 11503	220R 1% 0.1W
3566	4822 117 11383	12k 1% 0,1W
3567	4822 117 11383	12k 1% 0,1W
3568	4822 051 20153	15k 5% 0,1W
3569	4822 051 20153	15k 5% 0,1W
3570	4822 117 11383	12k 1% 0,1W
3571	4822 117 11383	12k 1% 0,1W
3574	4822 051 20223	22k 5% 0,1W
3575	4822 051 20223	22k 5% 0,1W
3576	4822 051 20223	22k 5% 0,1W
3577	4822 051 20223	22k 5% 0,1W
3579	4822 051 20471	470R 5% 0,1W
3580	4822 051 20223	22k 5% 0,1W
3581	4822 051 20223	22k 5% 0,1W
3582	4822 117 11454	820R 1% 0,1W
3583	4822 117 11454	820R 1% 0,1W
3584	4822 051 10102	1k 2% 0,25W
3585	4822 051 20479	47R 5% 0,1W
3586	4822 117 11449	2k2 1% 0,1W
3587	4822 117 11507	6k8 1% 0,1W
3588	4822 051 20471	470R 5% 0,1W
3589	4822 051 20105	1M 5% 0,1W
3590	4822 051 20105	1M 5% 0,1W
3591	4822 117 10833	10k 1% 0,1W
3592	4822 051 20273	27k 5% 0,1W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3595	4822 051 20273	27k 5% 0,1W
3596	4822 051 20683	68k 5% 0,1W
3597	4822 051 20683	68k 5% 0,1W
3598	4822 051 10102	1k 2% 0,25W
3599	4822 051 10102	1k 2% 0,25W
3601	4822 116 83884	47k 5% 0,5W
3602	4822 116 83884	47k 5% 0,5W
3603	4822 051 20105	1M 5% 0,1W
3604	4822 051 20105	1M 5% 0,1W

ELECTRICAL PARTS LIST - COMBI BOARD

RESISTORS

3605	4822 051 20104	100k 5% 0,1W
3606	4822 051 20104	100k 5% 0,1W
3607	4822 051 20474	470k 5% 0,1W
3608	4822 051 20474	470k 5% 0,1W
3614	4822 116 83864	10k 5% 0,5W
3615	4822 116 83864	10k 5% 0,5W
3616	4822 051 20104	100k 5% 0,1W
3617	4822 117 11139	1k5 1% 0,1W
3618	4822 117 11139	1k5 1% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3631	4822 051 20471	470R 5% 0,1W
3632	4822 051 20105	1M 5% 0,1W
3633	4822 051 20105	1M 5% 0,1W
3634	4822 051 20822	8k2 5% 0,1W
3635	4822 051 20822	8k2 5% 0,1W
3636	4822 051 20471	470R 5% 0,1W
3637	4822 051 20471	470R 5% 0,1W
3638	4822 051 20472	4k7 5% 0,1W
3639	4822 051 20472	4k7 5% 0,1W
3641	4822 117 10833	10k 1% 0,1W
3643	4822 051 20105	1M 5% 0,1W
3644	4822 051 20681	680R 5% 0,1W
3645	4822 117 12955	2k7 1% 0,1W
3647	4822 101 21204	20kA
3648	4822 051 20471	470R 5% 0,1W
3650	4822 051 20104	100k 5% 0,1W
3651	4822 051 20104	100k 5% 0,1W
3652	4822 117 10833	10k 1% 0,1W
3653	4822 117 10833	10k 1% 0,1W
3655	4822 117 10833	10k 1% 0,1W
3656	4822 051 20008	0R Jumper 0805
3657	4822 051 20008	0R Jumper 0805
4200	4822 051 20008	0R Jumper 0805
4201	4822 051 20008	0R Jumper 0805
4202	4822 051 20008	0R Jumper 0805
4203	4822 051 20008	0R Jumper 0805
4205	4822 051 20008	0R Jumper 0805
4206	4822 051 20008	0R Jumper 0805
4207	4822 051 20008	0R Jumper 0805
4208	4822 051 20008	0R Jumper 0805
4209	4822 051 20008	0R Jumper 0805
4210	4822 051 20008	0R Jumper 0805
4211	4822 051 20008	0R Jumper 0805
4212	4822 051 20008	0R Jumper 0805
4213	4822 051 20008	0R Jumper 0805
4214	4822 051 20008	0R Jumper 0805
4215	4822 051 20008	0R Jumper 0805
4216	4822 051 20008	0R Jumper 0805
4217	4822 051 20008	0R Jumper 0805
4218	4822 051 20008	0R Jumper 0805
4219	4822 051 20008	0R Jumper 0805
4220	4822 051 20008	0R Jumper 0805
4244	4822 051 20008	0R Jumper 0805
4500	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4503	4822 051 20008	0R Jumper 0805
4507	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 20008	0R Jumper 0805
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805
4549	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 20008	0R Jumper 0805

4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4564	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4566	4822 051 20008	0R Jumper 0805
4568	4822 051 20008	0R Jumper 0805
4569	4822 051 20008	0R Jumper 0805
4570	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4572	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5202	4822 157 71285	Coil 400µH 30%
5321	4822 157 11477	Coil 2,2µH 5%
5322	4822 157 11477	Coil 2,2µH 5%
5324	4822 157 11477	Coil 2,2µH 5%
5501	4822 157 11477	Coil 2,2µH 5%
5502	4822 157 62552	Coil 2,2µH
5503	4822 157 62255	Coil 18,5 Turns
5504	4822 157 62255	Coil 18,5 Turns
5505	4822 157 62255	Coil 18,5 Turns
5506	4822 157 62255	Coil 18,5 Turns
5507	4822 156 21721	Coil 2,2µH 10%
5508	4822 157 53447	BEAD EMI 100MHz
5640	4822 157 11526	Coil 22µH 5%

DIODES

6220	4822 130 31878	1N4003G
6221	4822 130 31878	1N4003G
6222	4822 130 31878	1N4003G
6223	4822 130 31878	1N4003G
6224	4822 130 31878	1N4003G
6225	4822 130 31878	1N4003G
6226	4822 130 31878	1N4003G
6227	4822 130 31878	1N4003G
6228	4822 130 34173	BZX79-B5V6
6229	4822 130 34379	BZX79-B27
6230	4822 130 31878	1N4003G
6231	4822 130 34174	BZX79-B4V7
6232	4822 130 30621	1N4148
6233	4822 130 30621	1N4148
6235	4822 130 30621	1N4148
6236	4822 130 34233	BZX79-B5V1
6237	4822 130 34233	BZX79-B5V1
6240	4822 130 31878	1N4003G
6241	4822 130 31878	1N4003G
6242	4822 130 31878	1N4003G
6243	4822 130 31878	1N4003G
6244	4822 130 31878	1N4003G
6245	4822 130 31878	1N4003G
6248	4822 130 31878	1N4003G
6249	4822 130 31878	1N4003G
6250	4822 130 31878	1N4003G
6251	4822 130 31878	1N4003G
6255	4822 130 31878	1N4003G
6321	4822 130 31878	1N4003G
6322	4822 130 31878	1N4003G
6323	4822 130 31878	1N4003G
6324	4822 130 31878	1N4003G
6325	4822 130 34281	BZX79-B15
6326	4822 130 31024	BZX79-B18
6327	5322 130 31504	BZX79-B3V3
6328	4822 130 31878	1N4003G
6329	4822 130 30621	1N4148
6330	4822 130 30621	1N4148
6442	4822 130 10792	LTL-1CHPE
6443	4822 130 10792	LTL-1CHPE
6444	4822 130 10792	LTL-1CHPE
6502	4822 130 34173	BZX79-B5V6
6549	4822 130 30621	1N4148
6550	4822 130 30621	1N4148
6551	4822 130 34173	BZX79-B5V6
6552	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

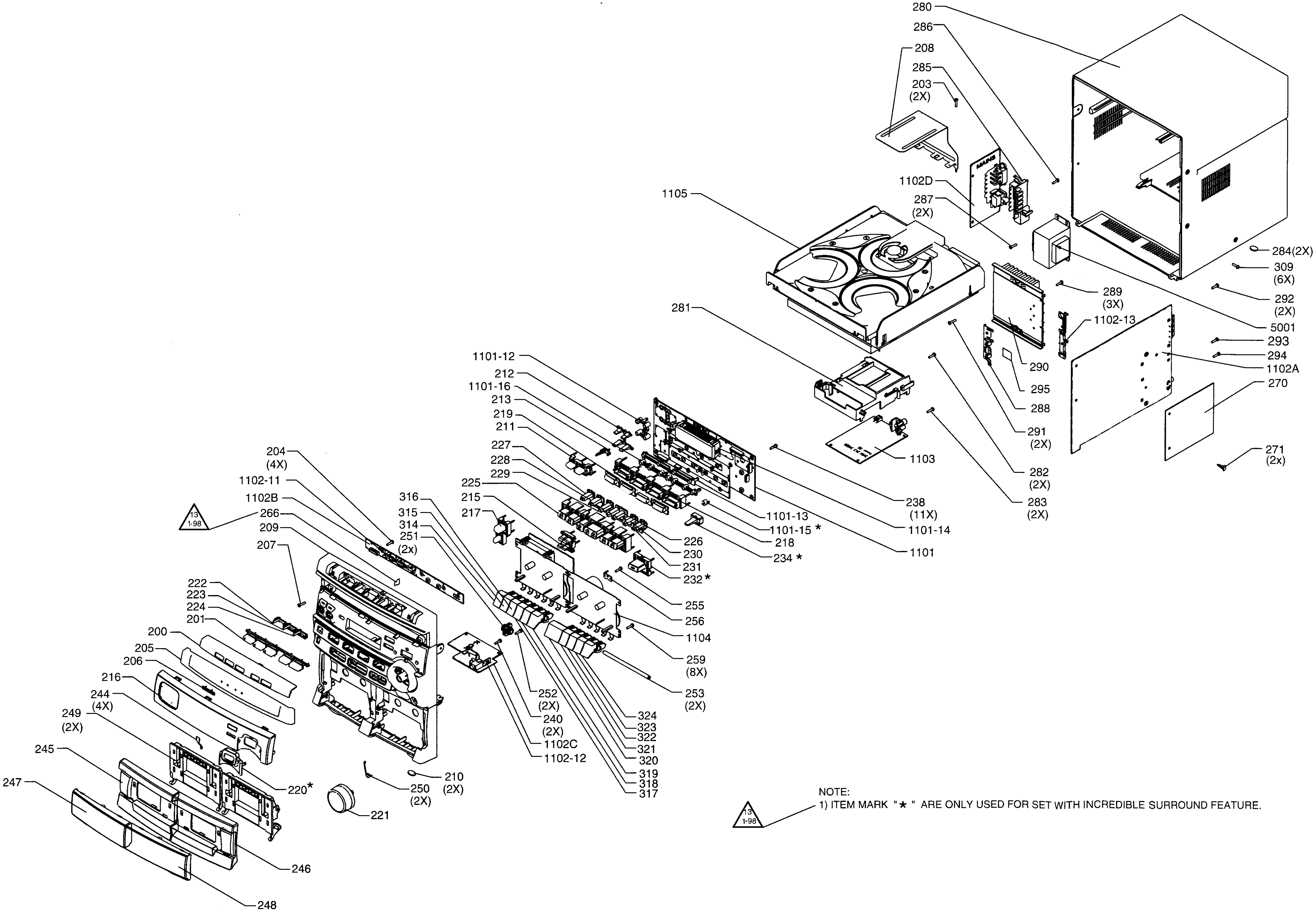
7241	4822 130 40959	BC547B
7242	5322 130 44593	BC369
7243	4822 130 40959	BC547B
7244	4822 130 40959	BC547B
7245	4822 130 40959	BC547B
7246	4822 130 40981	BC337-25
7247	4822 130 40981	BC337-25
7248	4822 130 40981	BC337-25
7249	4822 130 41246	BC327-25
7250	4822 209 33575	L7812CP
7320	4822 130 42615	BC817-40
7321	4822 130 42615	BC817-40
7322	4822 130 42615	BC817-40
7323	4822 130 42615	BC817-40
7329	4822 130 10847	BDW94C
7330	4822 130 40959	BC547B
7331	5322 130 60508	BC857B
7332	5322 130 60508	BC857B
7333	4822 130 42615	BC817-40
7391	4822 209 16224	AN7125
7400	5322 130 60508	BC857B

ELECTRICAL PARTS LIST - COMBI BOARD

TRANSISTORS & INTEGRATED CIRCUITS

7401	4822 130 40981	BC337-25
7402	5322 209 11306	HEF4094BT
7501	5322 209 11102	HEF4052BT
7503	4822 130 41096	BC550C
7504	4822 130 41096	BC550C
7505	4822 130 44568	BC557B
7506	4822 130 44568	BC557B
7507	4822 130 44568	BC557B
7508	4822 130 44568	BC557B
7530	5322 209 14482	HEF4069UBT
7537	4822 130 60511	BC847B
7538	4822 130 60511	BC847B
7539	4822 130 60511	BC847B
7540	4822 130 60511	BC847B
7541	4822 130 60511	BC847B
7542	4822 130 60511	BC847B
7543	4822 130 60511	BC847B
7544	4822 130 60511	BC847B
7545	5322 130 60508	BC857B
7546	5322 130 60508	BC857B
7547	4822 130 60511	BC847B
7548	4822 130 60511	BC847B
7549	4822 130 60511	BC847B
7550	4822 130 60511	BC847B
7554	4822 209 31378	NJM4556MB
7556	5322 130 60508	BC857B
7641	4822 130 41096	BC550C
7642	4822 130 41096	BC550C
7643	4822 130 41096	BC550C

Note : Only the parts mentioned in this list are normal service parts.


280
286
208
285
203
(2X)
1102D
287
(2X)
1105
284(2X)
309
(6X)
289
(3X)
292
(2X)
1102-13
5001
293
294
1102A
270
281
290
295
288
291
(2X)
1103
282
(2X)
283
(2X)
271
(2x)
1101-12
212
1101-16
213
219
211
227
228
229
225
215
217
204
(4X)
1102-11
1102B
13
1-98
266
209
207
316
315
314
251
(2x)
238
(11X)
1101-13
1101-15 *
218
234 *
1101-14
1101
226
230
231
232*
255
256
1104
259
(8X)
253
(2X)
222
223
224
201
200
205
206
216
244
(4X)
249
(2X)
245
247
220*
221
250
(2X)
210
(2X)
252
(2X)
240
(2X)
1102C
1102-12
324
323
322
321
320
319
318
317
246
248

13
1-98

NOTE:
1) ITEM MARK "*" ARE ONLY USED FOR SET WITH INCREDIBLE SURROUND FEATURE.

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

200	4822 450 10439		Window CDC
201	4822 410 11635		Button Open/Close CDC/SEL
205	4822 442 01246		Cover Tray CDC
205	4822 442 01271		Cover Tray CDC /37
206	4822 454 13035		Badge Philips
206	4822 454 13265		Badge (Ph-Mag) Assembly /37
209	4822 459 04928		Cabinet Front /21/21M
209	4822 459 04927		Cabinet Front /22/30
209	4822 459 04887		Cabinet Front /37
210	4822 462 40683		Plate (Foot)
211	4822 410 11636		Button Set DSC/DBB
215	4822 410 11726		Button Set CLK/RDS/NEWS /21/21M/30
215	4822 410 11657		Button Set CLK/RDS /22/37
216	4822 450 10468		Window Display
216	4822 450 10477		Window Display /37
217	4822 410 11638		Button Set Power/HSD
218	4822 410 11643		Button Source Select
220	4822 442 01268		Cover Incredible Sound
221	4822 410 11727		Knob Volume Rotary
225	4822 410 11729		Button Set Controls
232	4822 410 11705		Button Incredible Sound
239	4822 410 11728		Knob Karaoke
244	4822 492 70231		Spring Leaf
245	4822 442 01275		Cover Cassette Left
246	4822 442 01276		Cover Cassette Right
247	4822 381 11937		Lens Cassette Left
248	4822 381 11938		Lens Cassette Right
249	4822 443 10881		Door Cassette (Mech)
250	4822 492 42709		Spring-Door
251	4822 529 10322		Damper Assy
271	4822 466 93148		Spacer 5mm
280	4822 426 10598		Cabinet Rear /21/22/30
280	4822 426 10605		Cabinet Rear /21M
280	4822 426 10609		Cabinet Rear /37
284	4822 462 40683		Plate (Foot)
314	4822 410 11656		Button Record 1
315	4822 410 11658		Button Play 1
316	4822 410 11659		Button Rewind 1
317	4822 410 11661		Button F.Forward 1
318	4822 410 11662		Button Stop/Eject 1
319	4822 410 11663		Button Pause 1
320	4822 410 11664		Button Play 1
321	4822 410 11665		Button Rewind 2
322	4822 410 11666		Button F.Forward 2
323	4822 410 11667		Button Stop/Eject 2
324	4822 410 11668		Button Pause 2
350	4822 445 10747		LS Pair To Left /21/21M/30
350	4822 445 10745		LS Pair To Left /22
350	4822 445 10752		LS Pair To Left /37
350	4822 445 10748		LS Pair To Right /21/21M/30
350	4822 445 10746		LS Pair To Right /22
350	4822 445 10753		LS Pair To Right /37
351	4822 303 50063		FM Aerial
351	4822 320 11094		FM Aerial /37
352	4822 445 10756		Sur. Speaker Pair To Single /37
356	4822 219 10453		Remote Control
356	4822 219 10433		Remote Control /37
384	4822 303 50082		AM Frame Aerial
385	4822 321 10249	⚠	Mains Cord /21/21M/22
385	4822 321 10954	⚠	Mains Cord /30
385	4822 321 10882	⚠	Mains Cord /37
387	4822 736 15969		Instruction For Use /21/21M/30
387	4822 736 15955		Instruction For Use /22
387	4822 736 15981		Instruction For Use /37
1456	4822 320 12246		Flex Cable 13Pins 22cm
5001	4822 146 10951	⚠	Mains Transformer /21/21M
5001	4822 146 10949	⚠	Mains Transformer /22/30
5001	4822 146 10957	⚠	Mains Transformer /37

Note : Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

203	M3 x 6
204	D3 x 12
207	D3 x 12
238	D3 x 12
240	D3 x 12
252	M3 x 12
255	D3 x 12
259	D3 x 12
282	D3 x 12
283	D3 x 12
286	D3 x 12
287	M3 x 16
289	M3 x 15
291	M3 x 16
292	D3 x 12
293	D3 x 12
294	D3 x 12
309	D3 x 12